

# NETWORK WORLD

The Newsweekly of Enterprise Network Strategies

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## New message engine due for NetWare

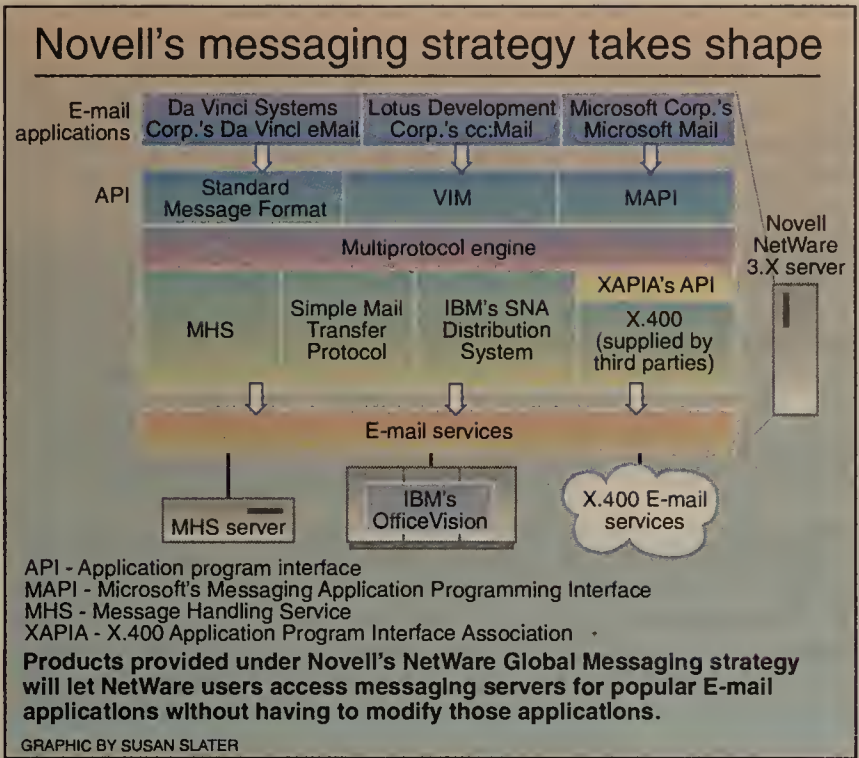
By Caryn Gillooly and Margie Wylie  
Network World Staff

SALT LAKE CITY — Novell, Inc. is set to announce this week its NetWare Global Messaging architecture, which will be fleshed out during the course of the year with a series of NetWare server add-ons.

The cornerstone of the architecture is a NetWare Loadable Module (NLM) multiprotocol engine that will offer users access — through nearly any messaging application — to a wide range of messaging services, such as Novell's Message Handling Service (MHS), the Simple Mail Transfer Protocol (SMTP), IBM's Systems Network Architecture Distribution Services (SNADS) and X.400.

Each messaging service will ship as a separate NLM, allowing users to load only the services they need.

Analysts said the architecture promises to streamline Novell's now-fragmented electronic mail strategy. It will also relieve application developers of the burden (continued on page 45)



## New crop of feature-rich X.400 products emerging

By Bob Brown  
Senior Editor

A slew of electronic messaging products based on the CCITT's 1988 X.400 standard will hit the shelves this year, carrying with them the potential to jump-start the standards-based messaging U.S. market.

The new products promise improved security, powerful directory capabilities and more flexi-

ble message-handling features. But observers caution that the rollout of such features could come in fits and starts and that interoperability issues will need to be worked out before users can enjoy the full advantages of the 1988 version.

The 1988 X.400 product parade began recently when start-up International Standards Open (continued on page 46)

## AT&T laying plans for broadband SDN

Software-Defined Broadband Network services would be ATM-based; support voice, data, video.

By Bob Wallace  
Senior Editor

BASKING RIDGE, N.J. — AT&T has a high-bandwidth service on the drawing board called Software-Defined Broadband Network (SDBN) that will support everything from voice traffic to high-quality video, according to documents obtained by Network World.

The service, which could be available within three years, would be offered in three versions: Data SDBN Service, Multimedia SDBN Service and Voice-Only SDBN Service.

SDBN would be built using Asynchronous Transfer Mode (ATM) cell relay technology on a Synchronous Optical Network physical transmission infrastructure.

"[With SDBN,] users can dynamically select the performance required of the wide-area network up to speeds of 600M bit/sec and configure their networks as either all virtual, all private-line equivalent or a combination of both," according to the docu-

ments, which are being used in AT&T customer needs analysis surveys.

A common set of features will be available for all three versions of the service, including three access options: dedicated access using facilities ranging in speed from 64K to 600M bit/sec, switched access using a Switched Multimegabit Data Service, or frame relay.

Other standard features include support for both connectionless and connection-oriented services, bandwidth on demand, self-healing capabilities and directory services for inter- and intraenterprise communications.

AT&T would neither confirm nor deny that SDBN is under development.

### Data SDBN

Data SDBN is designed to support "data and image applications and provide an evolutionary architecture for migration of today's private-line data networks to hybrid solutions while (continued on page 44)

### NETLINE

**FRAME RELAY FORUM** to finalize specifications for new network capabilities. Page 4.

**TI RELEASES** dual-protocol chip that supports both Ethernet and token-ring local nets. Page 4.

**CA ANNOUNCES** plans for new client/server version of its dBFast DBMS that supports SQL. Page 4.

**IBM UNIT UNVEILS** software that allows LAN users to access printers across an enterprise net. Page 4.

**SNMP KIT LETS USERS** extend MIBs to support new objects in Unix environments. Page 44.

**INTERNATIONAL LINK** between MANs demonstrated at CeBIT in Germany. Page 44.

### FEATURE

## The secret to success with virtual nets

By Daniel Briere  
Contributing Editor

Firms lured to virtual private networks by the ability to mix the control and economics of private nets with the reliability and expandability of the public network are now using the service to support a rash of new applications and strategic business initiatives.

Today, companies are using virtual networks to support everything from inbound traffic to a wealth of advanced applications, such as videoconferencing and disaster recovery.

Some companies even adjust their marketing plans and direct sales efforts based on network

traffic data obtained from virtual net invoices and management reports.

It's no wonder, then, that choosing a virtual network service provider has become a strategic purchase decision for firms that spend more than \$25,000 a month on long-distance service.

Wide user acceptance has prompted the Big Three — AT&T, MCI Communications Corp. and Sprint Corp. — to beef up their virtual net

services. For instance, the carriers intend to offer features that perform customer premises equipment-like functions such as automatic call distribution.

Carriers are also raising virtual net prices. During the past year, costs have increased at least 5% on average, with another 5% hike likely to occur by year end.

The virtual net price wars of the past are giving way to rates that are reflective of (continued on page 31)



# MCI bests rivals in bid for air traffic control system

Will upgrade FAA net over next three years to digital backbone with fiber-optic, microwave links.

By Anita Taff  
Washington Bureau Chief

WASHINGTON, D.C. — MCI Communications Corp. last week announced it had beat out rivals AT&T and Sprint Corp. to win its largest contract, a deal to upgrade the Federal Aviation Administration's (FAA) aging air traffic control system.

The three-year contract, dubbed the Leased Interfacility National Airspace Communications System (LINCS), will be worth \$856 million if the FAA signs up for all seven of the one-year renewal options.

Under the contract, MCI will

provide a digital backbone consisting of fiber-optic and microwave links to carry private-line voice and data traffic for the FAA's critical operations. In addition to network services, MCI will provide network management software and services as well as multiplexing equipment.

LINCS will connect 156 sites nationwide, including airport control towers, radar centers, air traffic approach centers and flight service stations. The network will carry everything from radio communications between pilots and air traffic controllers

(continued on page 45)

# Low ENE attendance raises questions about OSI status

MAP/TOP disenchantment also cited as factor.

By Wayne Eckerson  
Senior Editor

WASHINGTON, D.C. — Judging by the turnout at the Enterprise Networking Event (ENE) '92 here last week, the engine driving the open systems movement needs a major overhaul.

Only 135 people and eight exhibitors attended the event, which was billed as the only exposition and conference dedicated to Open Systems Interconnection and Integrated Services Digital Network technologies.

While conference organizers blamed the recession for the poor showing, they admitted the grow-

ing popularity of the Transmission Control Protocol/Internet Protocol and user and vendor disenchantment with the Manufacturing Automation Protocol/Technical and Office Protocol also hurt attendance.

The poor turnout contrasts sharply with the last ENE show in 1988, which drew more than 7,000 people and 200 exhibitors. It focused exclusively on MAP/TOP 3.0, which had just been released as a specification.

But the high expectations at ENE '88 ironically may account for the poor showing at ENE '92.

(continued on page 45)

# CrossComm device limits NETBIOS packet storms

By Maureen Molloy  
Staff Writer

MARLBOROUGH, Mass. — CrossComm Corp. will announce today software for its ILAN bridge/router that will help eliminate NETBIOS packet broadcast overhead associated with IBM Token-Ring local-area networks.

The software will enable users to more efficiently transport IBM's Network Basic I/O System traffic through internetworks by enabling bridges to learn the location of nodes and forward packets on a targeted basis instead of broadcasting them to all internet nodes.

"The condition isn't serious on small Token-Ring LANs for which NETBIOS was originally designed," said Gregory Koss, CrossComm's vice-president of product marketing. "But when you start sending NETBIOS over a wide-area network, it floods the internet with broadcast packets and creates a significant performance bottleneck."

## Fighting the storms

NETBIOS broadcast storms are particularly troublesome on low-speed wide-area links, where they can slow communications

(continued on page 45)

## Briefs

**IBM to announce mainframe APPN products.** IBM this week will roll out its much anticipated Advanced Peer-to-Peer Networking (APPN) mainframe software and APPN network node licensing specifications. Sources indicate that IBM will also unveil new versions of VTAM and Network Control Program software that support the APPN network node, in addition to a blueprint that outlines how IBM's Systems Network Architecture will support multiprotocol enterprise nets.

The company will also announce Dependent LU Server and Requester software that will encapsulate 3270 data in LU 6.2 sessions for routing over APPN networks. Cisco Systems, Inc., Novell, Inc. and Proteon, Inc. are expected to be on hand for the announcement as the first companies to license the network node specification.

**Pa. rules out caller ID.** In a decision that may have implications for other states considering the issue, the Pennsylvania Supreme Court last week ruled that caller identification service violates the state's wiretap laws, and, therefore, it would be illegal for Bell Telephone Co. of Pennsylvania to offer the service. The decision upheld a lower court ruling from December 1989 that blocked the provision of caller ID in the state except for emergency service providers.

**Satellite loan bill filed for educators.** Sen. Conrad Burns (R-Mont.) last week introduced the Educational Satellite Loan Guarantee bill, which authorizes the secretary of education to carry out a loan program so U.S. schools and universities can purchase, lease or operate satellite networks to distribute instructional programming to other institutions. The secretary would be authorized to grant loan guarantees of as much as \$270 million to state and local educational institutions and would seek to promote a shared satellite system for educational use.

**Lone-star network.** The state of Texas has signed a \$678,000 contract with IBM's Networking Systems Services group under which Big Blue will write a request for proposal for a new state network design. The new net will be managed by the state, which is seeking to lower costs and improve connectivity among some 3,900 sites, said Carl Stringfellow, director of telecommunications for Texas' General Services Commission. The net will be designed to fit into the state's long-term plan for migrating to a Government Open Systems Interconnection Profile architecture. Since IBM is writing the RFP, it will not be allowed to bid for the huge network contract, Stringfellow said.

**Switched service group meets.** The Switched Digital Services Applications Forum last week agreed at its meeting in Plano, Texas, to publish a document outlining available switched services and the customer premises equipment that support them. The document is scheduled to be released at the Tele-Communications Association, Inc. trade show in September.

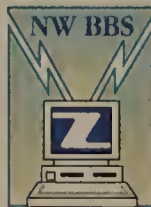
**JitterBuster now patented.** Proteon, Inc. last week was awarded a U.S. patent for its JitterBuster jitter absorption technology for IEEE 802.5 token-ring networks. The technology enables users to achieve transmission speeds of 16M bit/sec on unshielded twisted-pair wire.

The JitterBuster chip, which can be integrated in both passive and active token-ring wiring hubs, eliminates jitter by filtering and cleaning electronic signals.

## CONTACTS



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# Try Explaining To Your CEO That Network Response Time Is Poor Because Your Routers Don't Have A Symmetric Multiprocessor Architecture.

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## When Your Networks Are Complex, Your Choice Is Simple.

# Forum nears completion of new key frame relay specs

By Bob Wallace  
Senior Editor

MOUNTAIN VIEW, Calif. — The Frame Relay Forum is finalizing specifications for important new frame relay network capabilities, such as support for switched virtual circuits (SVC), data multicasting and an intelligent network-to-network interface.

The new features will give users greater flexibility in designing frame relay nets and enable carriers to offer wider connectivity between frame relay services.

"SVCs, multicasting and [an

intelligent] interface will make frame relay more attractive," said Larry Mauceri, a Frame Relay Forum member and senior director of product planning for Hughes Network Systems, Inc. in Germantown, Md.

Some officials said the specifications for these features could be finalized by midyear, although others cautioned they may not be ready until fall. Vendors said products supporting the features could be ready by year end.

Perhaps the most important new feature is the SVC support.

Today, users with private frame relay nets must establish a permanent virtual circuit (PVC) — basically a private line — between points in a frame relay net.

The same holds true in a public network, where the user tells the service provider which switches it needs links between and what speeds are required for the PVCs.

SVCs enable users to establish a dial-up connection — akin to a telephone call — for a frame relay transmission. The SVC is set up when a call is made and torn down when the call is completed.

According to Nick Lippis, president of Strategic Network Consulting, Inc. in Rockland, Mass., companies will likely use SVCs to support sites that generate little

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# TI rolls out two-protocol network chip

By Bob Brown  
Senior Editor

HOUSTON — Texas Instruments, Inc. last week unveiled a dual-protocol chip for Ethernet and token rings that is designed to build support for both networks right into a computer's motherboard.

TI, a major supplier of token-ring chips, is pitching its TMS380C26 chip to personal computer makers initially but will later widen its sights to include makers of servers, routers, hubs and adapter cards. By designing the chip with network-ready PCs in mind, TI is hoping to drive that emerging market.

The company declined to name the PC makers it is currently working with on an OEM basis.

In an effort to further simplify development of network-ready desktop devices and other net gear, TI is providing OEM customers with Ethernet and token-ring drivers for net operating systems from Banyan Systems, Inc.,

Microsoft Corp. and Novell, Inc., among others. TI also unveiled a new technique for connecting PCs to the physical media.

The emergence of computers with motherboards supporting both Ethernet and token ring could be a boon to users, giving them greater network flexibility, observers said. It could also save users the cost of buying separate adapter cards.

"This will help make life easier for users," said Sandy Gant, a vice-president at InfoCorp, a Santa Clara, Calif., market research

firm. "Users will be able to buy network-ready PCs at low cost. And they will be able to move PCs from site to site as the need arises."

“Users will be able to move PCs from site to site as the need arises,” Gant said.



firm. “Users will be able to buy network-ready PCs at low cost. And they will be able to move PCs from site to site as the need arises.”

Although the new chip will cost about 10% to 15% more than TI's token-ring chips, executives

from the company said the dual-protocol chip will actually drive down networking prices. Leon Adams, TI's open systems marketing manager, said vendors will not have to build separate network-ready PCs that support either Ethernet or token ring.

The move to integrate Ethernet and token ring is picking up steam in the industry. IBM and National Semiconductor Corp. recently discussed plans to target this market, as has Chips and Technologies, Inc.

According to Adams, the major difference is that TI's chips are shipping in volume. In a few months, the firm plans to announce several agreements with OEM vendors that will use the chips in their products, he said.

Brent Bilger, director of hardware product marketing at Cisco Systems, Inc., said he supports TI's effort to let desktop devices connect easily to Ethernet and token ring. But he said Cisco may not have a use for the new chip.

"In order to obtain Cisco's very high performance on both token-ring and Ethernet routing and bridging, we have optimized our hardware and software interface to each media," Bilger said. "Therefore, it's not clear that this chip would be appropriate for our interfaces." □

# CA to unveil client/server version of its dBFast DBMS

By Barton Crockett  
Senior Editor

ISLANDIA, N.Y. — At the Comdex/Spring trade show next month, Computer Associates International, Inc. (CA) plans to announce a client/server version of its dBFast database management system.

The new version of dBFast, CA's dBase IV-compliant soft-

ware for Windows-based personal computers, will support SQL as well as applications designed to work with the company's other DBMSs, such as CA-Datcom and CA-IDMS.

In the future, the \$1.3 billion software vendor plans to enhance dBFast with distributed DBMS capabilities that will enable multiple installations of the

product to interoperate with one another and other CA DBMSs across a network.

"This is a very shrewd move for CA to integrate [dBFast] with their other [DBMS] products," said Shaku Atre, president of Atre, Inc., a software consulting company in Rye, N.Y. "There aren't many vendors that can deliver integrated DBMS across multiple platforms."

Anders Vinberg, CA's senior vice-president of research and development, claimed that thousands of firms use dBFast, al-

(continued on page 47)

# Gupta set to offer product upgrades at DB/Expo '92

New development tools, gateway software to bow.

By Timothy O'Brien  
West Coast Bureau Chief

SAN FRANCISCO — At the DB/Expo '92 show here today, Gupta Technologies, Inc. will announce enhanced versions of all its products, including new releases of its development tools, database server and gateway software.

According to Gupta, the new offerings synchronize its product line with enhancements found in the latest version of its SQLBase database engine and improve the performance of its mainframe connectivity software.

"With these announcements, we are delivering all the advantages of SQLBase 5.0 in order to provide better performance and compatibility across our growing product line," said Ron Wolf, director of product management at Gupta.

The company's release of SQLBase 5.0 last fall provided performance enhancements, better support for graphical applications, tighter compatibility with IBM's DB2 and support for more platforms.

One of the early leaders in providing a way to develop local-area network-based graphical client/server applications, Gupta has spent the last year significantly broadening its product line to meet the evolving needs of this new market.

Gupta has introduced a new front-end database query tool dubbed Quest, delivered a faster version of its SQLBase database server engine as a NetWare Loadable Module (NLM), increased its connectivity options and provided enhancements to its SQLWindows development tool.

(continued on page 47)

# New IBM facility lets users access, manage printers

By Michael Cooney  
Senior Editor

NORWALK, Conn. — Pennant Systems Corp., an IBM company, last week announced software that lets local-area network users access and manage printers across an enterprise net.

Print Service Facility/2 (PSF/2) enables users to set up a print server that lets DOS, OS/2, Unix and Microsoft Corp. Windows nodes attached to IBM Token-Ring or Ethernet LANs easily access local or remote printers. And it helps manage print resources.

By using PSF/2, LAN users may send data to a remote host printer, a local printer or a variety of non-IBM printers. In a later release, users will be able to employ PSF/2 to retrieve data from attached mainframes, combine the information with local data and print the file as a whole.

PSF/2 fills out the low end of IBM's Advanced Function Printing (AFP) architecture, which spells out IBM's plans for helping users take advantage of printing facilities across the firm's System/390, Application System/400 and Personal System/2 platforms. Portions of AFP have already been implemented for the S/390 and AS/400 platforms.

"We've set up a client/server relationship for printers and their hosts," said Brian Platte, a senior programmer at the firm.

A key piece of the AFP strategy is support of the Intelligent Printer Data Stream, which handles communications for a wide range of printers.

PSF/2 supports Hewlett-Packard Co.'s Page Control Language Types 4 and 5, IBM's Page Printer Data Stream, PostScript and ASCII data streams, but it does not support impact printers.

Analysts said the product answers some IBM LAN users' requests, but there are still some holes in the strategy.

"The product simplifies maintenance, font management and other net printing issues, but it may be too IBM-centric," said Doug Allinger, an analyst with The Burton Group in Salt Lake City. "PostScript support doesn't come until later this year. The overhead is incredible, too."

PSF/2 requires OS/2 Communications Manager, an 80386- or 80486-based PS/2 supporting at least 12M bytes of memory and 2M bytes of memory for each active printer. It can run on a non-dedicated server.

PSF/2 will ship in two versions. Version 1.00, available March 27, does not support mainframe communications, Adobe or PostScript printer options. It costs \$2,900. Version 1.10, which adds those features, will be available in the fourth quarter at no cost for 1.00 users. □

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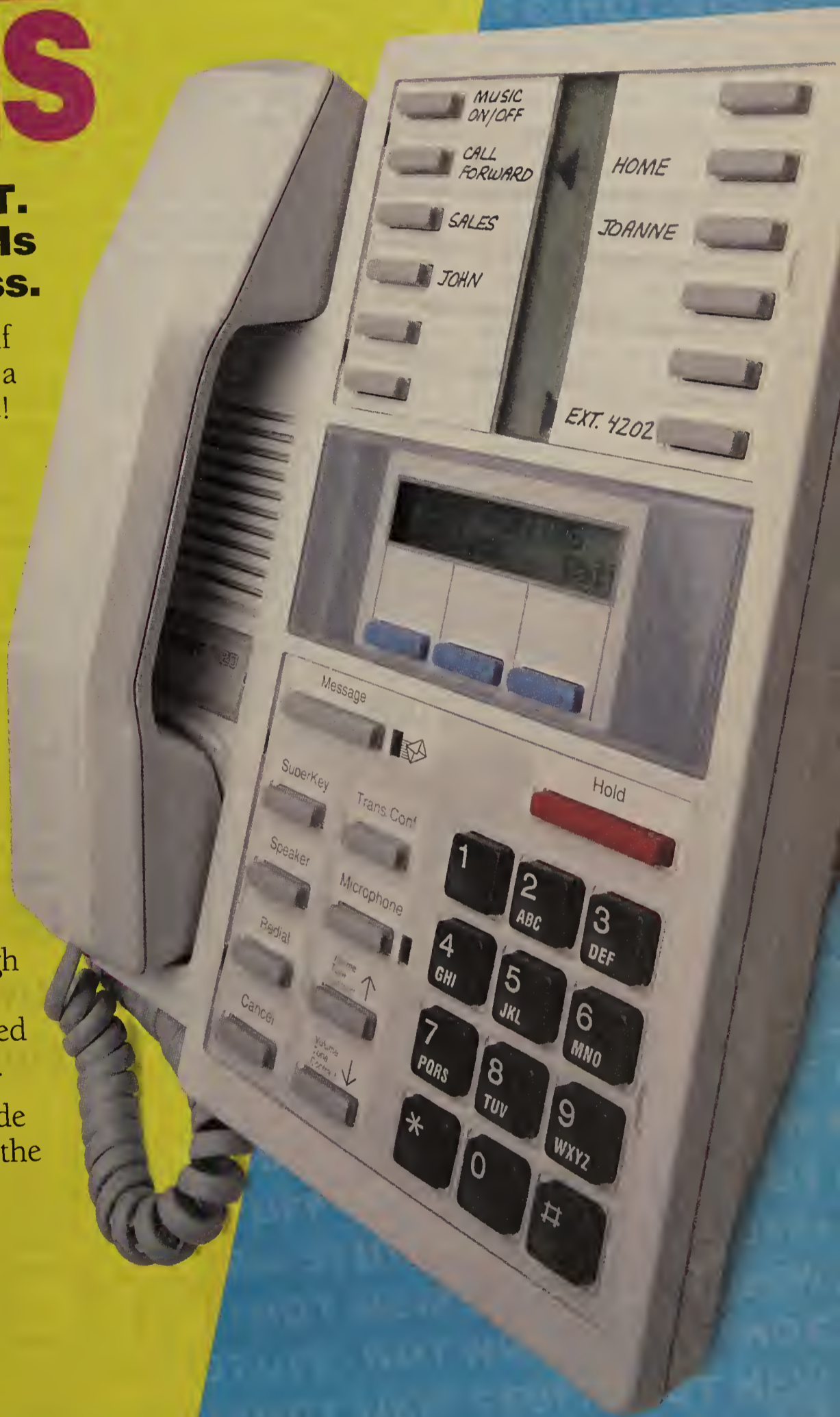
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Circle Reader Service #110

# HP to introduce traffic sampling net mgmt. tool

By Joanne Cummings  
Staff Writer

PALO ALTO, Calif. — Hewlett-Packard Co.'s Roseville Networks Division is expected to unveil next week new management software and traffic sampling technology for its EtherTwist hubs and bridges that offers users a cost-efficient way to monitor network traffic.

Together, the new OpenView Resource Manager/DOS software and HP Embedded Advanced Sampling Environment (EASE) technologies enable users to measure network usage in order to optimize resources and plan for changes and network growth.

HP EASE is software that can be downloaded into erasable programmable read-only memory (EPROM) on the bridges and hubs. It collects information on network traffic and uses statistical sampling and data filtering technology to store only the most critical network data.

The hubs and bridges are then polled by OpenView Resource Manager/DOS, a Microsoft Corp. Windows-based management system. The product uses the statistics gathered by the hubs and bridges to monitor net usage, packet error sources

and broadcast packet sources.

Because HP EASE uses sampling technology, it minimizes polling to less than 1% of the total net traffic, according to HP.

By placing HP EASE-equipped devices in strategic locations throughout a network, users can monitor the net continuously without affecting performance, even on heavily loaded networks. The software enables users to pinpoint trouble spots as well as find areas where they may need to deploy a protocol analyzer for a more detailed analysis.

HP Resource Manager/DOS is fully integrated with HP's OpenView Hub Manager and Interconnect Manager internet management systems. For example, from within a network map built by OpenView Hub Manager, a user can click on a segment of the net and activate Resource Manager to monitor network trends on that segment. Resource Manager trend analysis results are graphically displayed on the same console as the Hub Manager's network map.

Current users of HP's EtherTwist products can take advantage of the new sampling technology by downloading it to the product's EPROM. According to the company, all EtherTwist products shipped after last June contain EPROM and can support the new HP EASE technology.

Available June 1, the upgraded software is free of charge when users purchase HP OpenView Resource Manager/DOS, which is priced at \$2,000. HP said the HP EASE technology will be shipped at no additional cost on all EtherTwist products. ■

# Processor links SNA devices to Ethernet-based LAN backbones

By Maureen Molloy  
Staff Writer

IRVINE, Calif. — Sync Research announced last week a communications processor that lets users attach IBM controllers to Ethernet local-area networks, thereby allowing SNA data to be added to wide-area LAN internet backbones.

The Sync Network Access Controller/Ethernet Concentrator (SNAC/ENC) lets remote Synchronous Data Link Control devices, such as cluster controllers, be attached to Ethernet LANs so that Systems Network Architecture data can be sent to an IBM host via the same bridge/routers that support users' multiprotocol LAN traffic. That eliminates the need for multiple low-speed, wide-area SDLC lines.

The SNAC/ENC is similar to the vendor's existing product that links SNA devices to token-ring nets.

"While token ring is the dominant backbone network at IBM host sites, many users also have Ethernet LANs and 3270 terminals in remote offices," said Lynn Nye, Sync Research's director of product marketing. "This device will help users who want to consolidate their existing SNA devices onto their Ethernet networks."

The SNAC/ENC translates SNA/SDLC packets into a Logical Link Control (LLC) format. This contrasts with bridge/router solutions that wrap SDLC data in Transmission Control Protocol/Internet Protocol packets, which increases network overhead and delay.

After the SNAC/ENC makes the SDLC-to-LLC conversion, it passes packets to the Ethernet LAN. The data is then handed off to a bridge/router, which translates the traffic from an Ethernet to a token-ring format before sending it to a token ring-attached front-end processor (FEP)

at the host site.

The SNAC/ENC resides only at remote sites and supports any PU Type 1 or 2 device with an SDLC interface. It sits between cluster controllers and the Ethernet LAN and supports as many as 32 controllers.

It connects to the LAN at speeds up to 64K bit/sec — significantly faster than typical 9.6K bit/sec SDLC lines. The unit communicates with attached cluster controllers at speeds up to 19.2K bit/sec.

**“This device will help users who want to consolidate their existing SNA devices onto their Ethernet networks.”**

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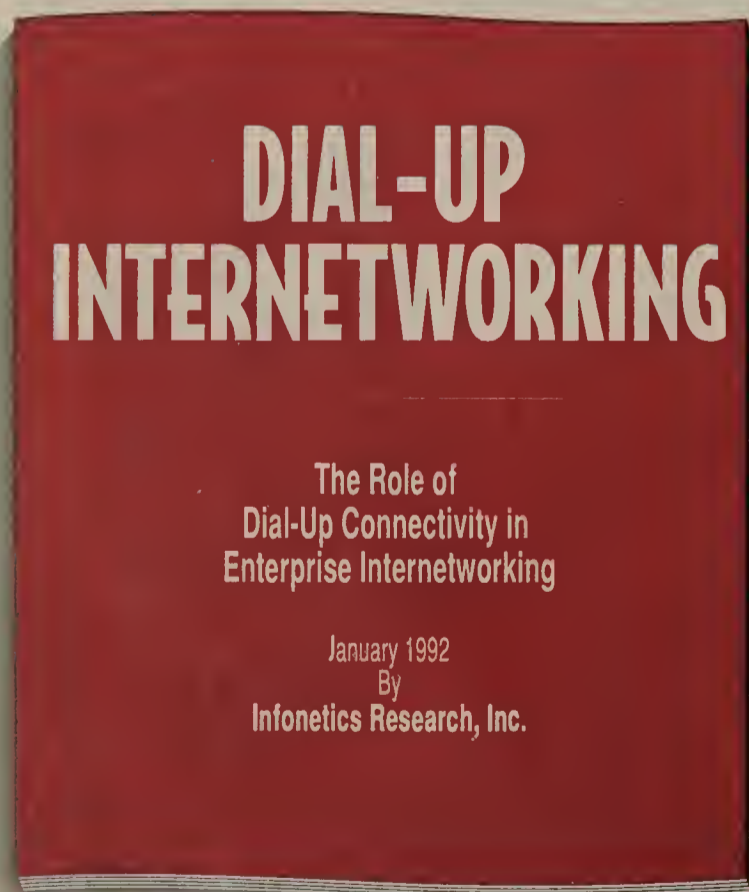
The SNAC/ENC uses an internal IEEE 802.3-compatible adapter for connecting SDLC, Binary Synchronous Communications and asynchronous devices to the Ethernet LAN.

The SNAC/ENC provides local polling for downstream SDLC devices, thereby preventing the wide-area links from becoming congested with superfluous SDLC polling traffic. That setup also reduces processing demands on host FEPs because the FEP polls only the SNAC/ENC and not each controller.

For net management, the SNAC/ENC can pass management data from attached controllers to NetView.

The SNAC/ENC is slated to be available by September. Pricing has not been set. ■

## How To Extend Your IP Network Without Overextending Your Budget.



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## ODS to unveil low-cost FDDI concentrators

By Joanne Cummings  
Staff Writer

RICHARDSON, Texas — Optical Data Systems, Inc. (ODS) next month is expected to release a new series of intelligent Fiber Distributed Data Interface wiring concentrators.

The concentrators are designed to provide high-end features, such as advanced management capabilities, to small work groups at an inexpensive price, according to Terry Gaston, vice-president of marketing at the company.

The 1085 series comes in models with four, six or eight FDDI ports. Each port can be configured to either link an FDDI local-area network or a workstation to an FDDI ring.

Thus, users can configure the concentrator to support one logical FDDI ring or link several workstations to a campus ring.

Most other work group concentrators require that users purchase separate cards to link the concentrator with a campus ring, Gaston said.

The concentrators also come with two media access control cards. One card enables a user at an attached workstation to monitor the traffic across the FDDI ring, while the other allows for the insertion of a new workstation into the concentrator without disrupting the flow of traffic on the network.

The units support Version 6.2 of the FDDI Station Management protocol for FDDI net management, as well as both in-band and out-of-band Simple Network Management Protocol management.

As an option, users can purchase a built-in optical bypass unit that enables traffic to continue to flow around a campus FDDI ring linked to the concentrator even if the concentrator is powered off, Gaston said. Most other work group concentrators require external optical bypass units.

Available next month, a four-port ODS 1085 costs \$8,700, a six-port unit is priced at \$12,000 and an eight-port model costs \$13,800.

The optional built-in optical bypass unit is priced at \$2,000. ■

# WHY KEYCORP IS BRANCHING OUT WITH GDC.

With branches reaching from Fort Kent, Maine, to Dutch Harbor, Alaska, KeyCorp – “America’s neighborhood bank”<sup>SM</sup> – is one of the fastest-growing financial institutions in the U.S. Whenever KeyCorp adds another branch to the 730 Key Bank offices it already has, it relies on GDC to help quickly achieve “backroom standardization.”

KeyCorp managers consider their communications network a major strategic asset. And they know it’s vital to get each new bank integrated as quickly as possible. That’s why they turn to GDC, their strategic partner for networking products, services, and support.

KeyCorp planners have standardized on GDC analog and digital access products. For their backbone network, they use the GDC Transport Management System. And their entire network is managed by a GDC Integrated Network Management System.

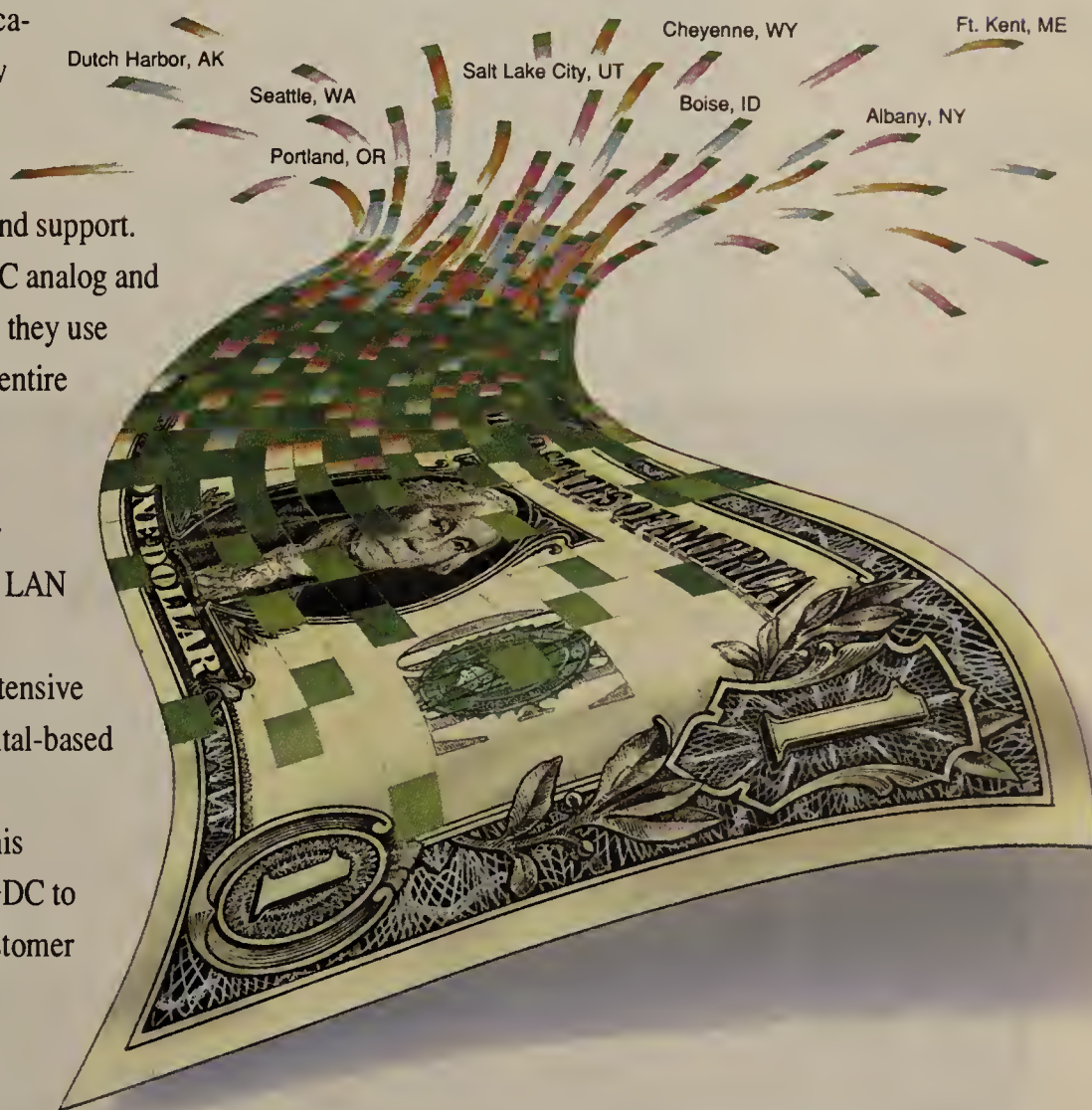
GDC supports LAN-to-WAN connectivity for internetworking of all KeyCorp offices. Each includes LAN traffic, voice, image, and other data applications.

GDC is also helping KeyCorp convert its extensive regional data enterprise network from analog- to digital-based technology.

Through its 6-year partnership with GDC, this innovative financial services company has utilized GDC to help lower costs, speed up performance, enhance customer service, and improve its edge in a highly competitive banking environment.

KeyCorp has found that GDC has the right products, the right network architecture, and the right vision to offer a reliable migration path to the communications technologies of the future. We think you’ll find the same.

General DataComm’s world class networks connect businesses and telephone companies in more than 60 countries. To connect with GDC, call 1-203-792-0542. In North America, call toll-free 1-800-777-4005.



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# UDS LanFast™ network modem puts your node on the road



Access to local area networks now extends well beyond the office walls, thanks to the new LanFast DM 20 from UDS.

The LanFast DM 20 is a LAN-resident dial-in/dial-out device, with a built-in V.32 bis/V.42 bis modem and Ethernet LAN adapter card. Its presence on a Novell LAN enables your "road warriors" to access the network, using a standard modem, from any place that offers a standard telephone jack.

The unit supports thick, thin or 10BaseT Ethernet, giving remote users and local nodes the same access to E-mail, shared databases and other network resources. Three levels of security deny access to unauthorized users, and a second high-speed serial port extends network reach by accommodating an external modem or high-speed digital device.

LanFast DM 20 is shipped with all necessary hardware and software. For remote access, it supports standard modems at speeds to 57.6 kbps and popular communications programs such as Procomm Plus Network and Crosstalk Mk. IV.

If your people on the move need everyday access to their home-base LANs, let them take a node on the road. For full details, contact UDS at:

**800/451-2369.**



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## 1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (Independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other

## 2 What is your job function? (check one only)

### NETWORKING MANAGEMENT

1. ☐ Networking Mgmt
2. ☐ LAN Mgmt
3. ☐ Datacom/Telecom Mgmt
4. ☐ Engineering Mgmt

### MIS MANAGEMENT

5. ☐ MIS, IS, IT, Mgmt
6. ☐ Engineering Mgmt

### CORPORATE MANAGEMENT

7. ☐ Corporate Mgmt (CIO, CEO, Pres, VP, Dir, Mgr, Financial Mgmt)
8. ☐ Consultant (Independent)
9. ☐ Other

## 3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100 +
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

## 4 Check all that apply in columns A and B:

- A: I am involved in the purchase of the following products/services.  
B: I plan to purchase the following products/services in the next 12 months.

- | Involved                     | Plan to Purchase         | A                                                                        | B |
|------------------------------|--------------------------|--------------------------------------------------------------------------|---|
| <b>LOCAL-AREA NETWORKS</b>   |                          |                                                                          |   |
| 01. <input type="checkbox"/> | <input type="checkbox"/> | Local-Area Networks                                                      |   |
| 02. <input type="checkbox"/> | <input type="checkbox"/> | LAN Servers                                                              |   |
| 03. <input type="checkbox"/> | <input type="checkbox"/> | LAN Operating Systems Software                                           |   |
| 04. <input type="checkbox"/> | <input type="checkbox"/> | Superservers                                                             |   |
| 05. <input type="checkbox"/> | <input type="checkbox"/> | Data Base Servers (Oracle, Sybase, etc)                                  |   |
| 06. <input type="checkbox"/> | <input type="checkbox"/> | Terminal Servers                                                         |   |
| 07. <input type="checkbox"/> | <input type="checkbox"/> | LAN Services                                                             |   |
| 08. <input type="checkbox"/> | <input type="checkbox"/> | LAN Storage Devices (Optical, Tape, Disk, Etc. including Backup Systems) |   |
| 09. <input type="checkbox"/> | <input type="checkbox"/> | Network Test Equipment                                                   |   |
| 10. <input type="checkbox"/> | <input type="checkbox"/> | Hubs                                                                     |   |
| 11. <input type="checkbox"/> | <input type="checkbox"/> | Cables, Connectors, Baluns                                               |   |
| 12. <input type="checkbox"/> | <input type="checkbox"/> | UPS                                                                      |   |
| 13. <input type="checkbox"/> | <input type="checkbox"/> | Network Adapter Boards                                                   |   |
| 14. <input type="checkbox"/> | <input type="checkbox"/> | Central Office LANs                                                      |   |
| 15. <input type="checkbox"/> | <input type="checkbox"/> | Wireless LANs                                                            |   |
| 16. <input type="checkbox"/> | <input type="checkbox"/> | SNMP Network Management                                                  |   |
| <b>INTERNETWORKING</b>       |                          |                                                                          |   |
| 17. <input type="checkbox"/> | <input type="checkbox"/> | Bridges                                                                  |   |
| 18. <input type="checkbox"/> | <input type="checkbox"/> | Routers                                                                  |   |
| 19. <input type="checkbox"/> | <input type="checkbox"/> | Gateways                                                                 |   |
| 20. <input type="checkbox"/> | <input type="checkbox"/> | Bridge/Router                                                            |   |
| 21. <input type="checkbox"/> | <input type="checkbox"/> | Hubs                                                                     |   |
| 22. <input type="checkbox"/> | <input type="checkbox"/> | Intelligent Hubs                                                         |   |
| 23. <input type="checkbox"/> | <input type="checkbox"/> | Communications Servers                                                   |   |
| <b>COMPUTERS/PERIPHERALS</b> |                          |                                                                          |   |
| 24. <input type="checkbox"/> | <input type="checkbox"/> | Micros/PCs                                                               |   |

## 5 What are your primary responsibilities? (check all that apply)

1. ☐ LANs
2. ☐ Internetworking
3. ☐ WANs

## 6 What is the scope of your involvement in purchase decisions for Network products & services? (check one only)

1. ☐ Enterprisewide (Organization/Subsidiary/Division)
2. ☐ Multienterprise (Consultants)
3. ☐ Departmentwide

## 7 Is your network: (check all that apply)

- LOCAL AREA NETWORKS**
1. ☐ Local (within building)
  2. ☐ Local (in a campus environment)
- WIDE AREA NETWORKS**
3. ☐ International
  4. ☐ National
  5. ☐ Regional (several states)
  6. ☐ Metropolitan

## 8 Which of the following network architectures/protocols are used? (check all that apply)

- |                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| 01. <input type="checkbox"/> SNA          | 08. <input type="checkbox"/> X.25             |
| 02. <input type="checkbox"/> DECNET       | 09. <input type="checkbox"/> NOVELL IPX/SPX   |
| 03. <input type="checkbox"/> OSI          | 10. <input type="checkbox"/> APPC/APPN/LU 6.2 |
| 04. <input type="checkbox"/> GOSIP        | 11. <input type="checkbox"/> NETBIOS          |
| 05. <input type="checkbox"/> MAP/TOP      | 12. <input type="checkbox"/> DEC LAT          |
| 06. <input type="checkbox"/> TCP/IP       | 13. <input type="checkbox"/> APPLE TALK       |
| 07. <input type="checkbox"/> DCA (Unisys) | 14. <input type="checkbox"/> OTHER            |

## 9 What is your LAN Operating System? (check all that apply)

01. ☐ LOCAL TALK (APPLE TALK)
02. ☐ BANYAN (VINES)
03. ☐ DCA (IRMALAN)
04. ☐ IBM (LAN SERVER)
05. ☐ IBM (PC LAN PROGRAM)
06. ☐ MICROSOFT (LAN MANAGER)
07. ☐ UNGERMANN-BASS
08. ☐ NOVELL (NETWARE, 2.X, 3.X)
09. ☐ PROTEON (PRONET)
10. ☐ SITKA (TOPS)
11. ☐ 3COM (3+, 3+ OPEN)
12. ☐ Other

## A. I Wish to Receive a FREE Subscription to Network World.

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Signature

Date

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# Pass-Along Qualification Form

- |                              |                          |                                  |                              |                          |                             |
|------------------------------|--------------------------|----------------------------------|------------------------------|--------------------------|-----------------------------|
| 25. <input type="checkbox"/> | <input type="checkbox"/> | Minis                            | 58. <input type="checkbox"/> | <input type="checkbox"/> | Protocol Converters         |
| 26. <input type="checkbox"/> | <input type="checkbox"/> | Mainframes                       | 59. <input type="checkbox"/> | <input type="checkbox"/> | Network Management Systems  |
| 27. <input type="checkbox"/> | <input type="checkbox"/> | Laptops                          | 60. <input type="checkbox"/> | <input type="checkbox"/> | Terminal Emulation Boards   |
| 28. <input type="checkbox"/> | <input type="checkbox"/> | Workstations                     | 61. <input type="checkbox"/> | <input type="checkbox"/> | Diagnostic/Test Equipment   |
| 29. <input type="checkbox"/> | <input type="checkbox"/> | Image Processing Workstations    | 62. <input type="checkbox"/> | <input type="checkbox"/> | DSU/CSU                     |
| 30. <input type="checkbox"/> | <input type="checkbox"/> | Front-End Processors             | 63. <input type="checkbox"/> | <input type="checkbox"/> | Data Compression Equipment  |
| 31. <input type="checkbox"/> | <input type="checkbox"/> | Terminals                        | 64. <input type="checkbox"/> | <input type="checkbox"/> | Microwave                   |
| 32. <input type="checkbox"/> | <input type="checkbox"/> | Printers                         | 65. <input type="checkbox"/> | <input type="checkbox"/> | Fax Boards                  |
| 33. <input type="checkbox"/> | <input type="checkbox"/> | Cluster Controllers              | 66. <input type="checkbox"/> | <input type="checkbox"/> | VSAT                        |
| 34. <input type="checkbox"/> | <input type="checkbox"/> | Fax Machines                     | 67. <input type="checkbox"/> | <input type="checkbox"/> | Fiber Optic                 |
|                              |                          |                                  | 68. <input type="checkbox"/> | <input type="checkbox"/> | Satellite                   |
|                              |                          |                                  | 69. <input type="checkbox"/> | <input type="checkbox"/> | ISDN                        |
| 35. <input type="checkbox"/> | <input type="checkbox"/> | Network Management               | 70. <input type="checkbox"/> | <input type="checkbox"/> | PBXs (over 1000 lines)      |
| 36. <input type="checkbox"/> | <input type="checkbox"/> | Micro to Mainframe               | 71. <input type="checkbox"/> | <input type="checkbox"/> | PBXs (200 - 1000 lines)     |
| 37. <input type="checkbox"/> | <input type="checkbox"/> | Network Security                 | 72. <input type="checkbox"/> | <input type="checkbox"/> | PBXs (under 200 lines)      |
| 38. <input type="checkbox"/> | <input type="checkbox"/> | Call Accounting                  | 73. <input type="checkbox"/> | <input type="checkbox"/> | Automatic Call Distributors |
| 39. <input type="checkbox"/> | <input type="checkbox"/> | Communication                    | 74. <input type="checkbox"/> | <input type="checkbox"/> | Voice Messaging Systems     |
| 40. <input type="checkbox"/> | <input type="checkbox"/> | Word Processing                  | 75. <input type="checkbox"/> | <input type="checkbox"/> | Videoconferencing Systems   |
| 41. <input type="checkbox"/> | <input type="checkbox"/> | Data Base Management             | 76. <input type="checkbox"/> | <input type="checkbox"/> | Central Office Switch       |
| 42. <input type="checkbox"/> | <input type="checkbox"/> | Spreadsheet                      | 77. <input type="checkbox"/> | <input type="checkbox"/> | Voice Response/Processing   |
| 43. <input type="checkbox"/> | <input type="checkbox"/> | Groupware                        | 78. <input type="checkbox"/> | <input type="checkbox"/> | Switched Voice              |
| 44. <input type="checkbox"/> | <input type="checkbox"/> | EDI                              | 79. <input type="checkbox"/> | <input type="checkbox"/> | Dedicated Leased Line       |
| 45. <input type="checkbox"/> | <input type="checkbox"/> | E-Mail                           | 80. <input type="checkbox"/> | <input type="checkbox"/> | Digital Data                |
| 46. <input type="checkbox"/> | <input type="checkbox"/> | Windows/Graphical User Interface | 81. <input type="checkbox"/> | <input type="checkbox"/> | Switched Data               |
| 47. <input type="checkbox"/> | <input type="checkbox"/> | 4-GL                             | 82. <input type="checkbox"/> | <input type="checkbox"/> | Centrex                     |
| 48. <input type="checkbox"/> | <input type="checkbox"/> | Multimedia                       | 83. <input type="checkbox"/> | <input type="checkbox"/> | On-Line Information         |
| 49. <input type="checkbox"/> | <input type="checkbox"/> | Graphics                         | 84. <input type="checkbox"/> | <input type="checkbox"/> | E-Mail                      |
|                              |                          |                                  | 85. <input type="checkbox"/> | <input type="checkbox"/> | SMDS                        |
|                              |                          |                                  | 86. <input type="checkbox"/> | <input type="checkbox"/> | Image Processing            |
| 50. <input type="checkbox"/> | <input type="checkbox"/> | Modems (9.6kbps and over)        | 87. <input type="checkbox"/> | <input type="checkbox"/> | Audio Teleconferencing      |
| 51. <input type="checkbox"/> | <input type="checkbox"/> | Modems (under 9.6kbps)           | 88. <input type="checkbox"/> | <input type="checkbox"/> | Local Services              |
| 52. <input type="checkbox"/> | <input type="checkbox"/> | T-1                              | 89. <input type="checkbox"/> | <input type="checkbox"/> | WATS MTs                    |
| 53. <input type="checkbox"/> | <input type="checkbox"/> | T-3                              | 90. <input type="checkbox"/> | <input type="checkbox"/> | International               |
| 54. <input type="checkbox"/> | <input type="checkbox"/> | Fractional T-1                   | 91. <input type="checkbox"/> | <input type="checkbox"/> | Virtual Networks            |
| 55. <input type="checkbox"/> | <input type="checkbox"/> | Data Switches                    | 92. <input type="checkbox"/> | <input type="checkbox"/> | Frame Relay                 |
| 56. <input type="checkbox"/> | <input type="checkbox"/> | Matrix Switches                  | XX. <input type="checkbox"/> | <input type="checkbox"/> | None of the above           |
| 57. <input type="checkbox"/> | <input type="checkbox"/> | Packet Switching                 |                              |                          |                             |

## 10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCAL TALK
8. ☐ 10BASE-T
9. ☐ OTHER

## 11 Are you involved in the implementation of client/server applications?

Yes ☐ No ☐

## 12 Which operating system do you utilize? (check all that apply)

- |                                           |                                      |
|-------------------------------------------|--------------------------------------|
| 01. <input type="checkbox"/> DOS          | 06. <input type="checkbox"/> VM      |
| 02. <input type="checkbox"/> UNIX/XENIX   | 07. <input type="checkbox"/> VMS     |
| 03. <input type="checkbox"/> OS/2         | 08. <input type="checkbox"/> NUBUS   |
| 04. <input type="checkbox"/> OS/2 EX. ED. | 09. <input type="checkbox"/> WINDOWS |
| 05. <input type="checkbox"/> MVS          | 10. <input type="checkbox"/> OTHER   |

## 13 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

## 14 Which of the following vendors equipment do you currently have installed in your network? (check all that apply)

- | Vendor              | Mainframes               | Minis                    |
|---------------------|--------------------------|--------------------------|
|                     | A                        | B                        |
| 01. DEC             | <input type="checkbox"/> | <input type="checkbox"/> |
| 02. IBM             | <input type="checkbox"/> | <input type="checkbox"/> |
| 03. AMDAHL          | <input type="checkbox"/> | <input type="checkbox"/> |
| 04. AT&T            | <input type="checkbox"/> | <input type="checkbox"/> |
| 05. BULL HNIS       | <input type="checkbox"/> | <input type="checkbox"/> |
| 06. NCR             | <input type="checkbox"/> | <input type="checkbox"/> |
| 07. DATA GENERAL    | <input type="checkbox"/> | <input type="checkbox"/> |
| 08. WANG            | <input type="checkbox"/> | <input type="checkbox"/> |
| 09. HEWLETT-PACKARD | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. PRIME           | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. TANDEM          | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. UNISYS          | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. CONTROL DATA    | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. OTHER           | <input type="checkbox"/> | <input type="checkbox"/> |

## 15 Please indicate the number of Microcomputers/Workstations:

- A. Presently installed in your network.  
B. The approximate quantity you plan to install in the next 12 months.

Micros/Workstations	Presently Installed	Plan to Install Next 12 Months
	A	B
1. Macintosh		
2. PCs Based on 80586 Chips	XXXX	
3. PCs Based on 80486 Chips		
4. PCs Based on 80386 Chips		
5. PCs Based on 80286 Chips		
6. PCs Based on 8086/8088 Chips		
7. Risc-Based Workstations		
8. Unix-Based Workstations		

## 16 Estimated value of networking equipment and services:

- A. Which you helped specify, recommend or approved in the last 12 months?  
B. Which you plan to help specify, recommend or approve in the next 12 months?

A	B
1. <input type="checkbox"/>	<input type="checkbox"/>
2. <input type="checkbox"/>	<input type="checkbox"/>
3. <input type="checkbox"/>	<input type="checkbox"/>
4. <input type="checkbox"/>	<input type="checkbox"/>
5. <input type="checkbox"/>	<input type="checkbox"/>
6. <input type="checkbox"/>	<input type="checkbox"/>
7. <input type="checkbox"/>	<input type="checkbox"/>
8. <input type="checkbox"/>	<input type="checkbox"/>
9. <input type="checkbox"/>	<input type="checkbox"/>

## 17 Estimated gross annual revenue of your entire company/institution: (check one only):

- |                                                      |                                                    |
|------------------------------------------------------|----------------------------------------------------|
| 1. <input type="checkbox"/> Over \$10 billion        | 5. <input type="checkbox"/> \$50 to \$99.9 million |
| 2. <input type="checkbox"/> \$1 to \$9.9 billion     | 6. <input type="checkbox"/> \$10 to \$49.9 million |
| 3. <input type="checkbox"/> \$500 to \$1 billion     | 7. <input type="checkbox"/> \$5 to \$9.9 million   |
| 4. <input type="checkbox"/> \$100 to \$499.9 million | 8. <input type="checkbox"/> Under \$5 million      |

## 18 Estimated number of employees for your entire corporation:

- |                                           |                                           |
|-------------------------------------------|-------------------------------------------|
| 1. <input type="checkbox"/> Over 10,000   | 4. <input type="checkbox"/> 1,000 - 2,499 |
| 2. <input type="checkbox"/> 5,000 - 9,999 | 5. <input type="checkbox"/> 500 - 999     |
| 3. <input type="checkbox"/> 2,500 - 4,999 | 6. <input type="checkbox"/> Under 500     |

# DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

## Worth Noting

“DEC’s in a very competitive market, and their strategy is to sell volume. They don’t want to be only in the VMS market anymore; they’re going for the high-quantity ship.”

Howard Niden  
Senior manager  
Price Waterhouse  
Cincinnati

## DEC preps ACA Services with Sun, Windows support

Supports data sharing among multiple platforms.

By Jim Duffy  
Senior Editor

MAYNARD, MASS. — Digital Equipment Corp. last week announced a new version of its application integration software that allows DEC systems to share information with applications on Sun Microsystems, Inc. and Microsoft Corp. Windows workstations.

Version 2.1 of DEC’s Application Control Architecture (ACA) Services software now allows applications to communicate using the Transmission Control Protocol/Internet Protocol and DEC’s DECnet/OSI transport protocols for VMS or Ultrix, without using remote procedure calls (RPC). Previously, the software only allowed applications to communicate using DEC RPCs over

TCP/IP.

ACA Services is object-oriented software that links independently developed applications, allowing them to issue calls to invoke the services of other applications and exchange data.

### Integration capability

Version 2.1 of ACA Services allows applications developed for Sun and Windows workstations to be integrated with DEC VMS and Ultrix applications, according to DEC. For example, a Microsoft Excel spreadsheet on a Windows client can access a database on an Ultrix or VMS server and retrieve data for use in the spreadsheet.

Prior to this release, ACA Services ran on DEC desktop and server systems. The new support  
(continued on page 27)

## Rumba Tools dance with Visual Basic

REDMOND, Wash. — Wall Data, Inc. last week unveiled software tools that are said to simplify development of graphical user interfaces (GUI) for personal computer-to-host applications.

The new Rumba Tools for Visual Basic works with Microsoft Corp.’s Visual Basic — an application development environment for Microsoft Windows — to translate host screens into a graphical Windows format for IBM 3270 and 5250 terminal-emulation applications.

The product complements Wall Data’s Rumba, a communications facility that provides access to IBM mainframe or Application System/400 applications from a Windows or IBM Presentation Manager GUI.

The appeal for Rumba Tools for Visual Basic could be the “pretty faces” it puts on IBM mainframe and minicomputer applications, said James Raisio, vice-president of customer services at Wall Data. The product has a feature called Form Builder that converts the functions of IBM host control function keys

into Rumba commands, allowing them to be depicted graphically on the Windows screen.

The Form Builder also converts host screen input fields into Visual Basic objects, allowing data to be entered into the host application through a GUI.

According to Raisio, Rumba Tools for Visual Basic was developed at Microsoft’s request.

According to Raisio, Rumba Tools for Visual Basic was developed at Microsoft’s request.

▲▲▲

“They felt they needed a good mechanism for connecting to host applications,” he said.

Microsoft is expected to have shipped between 17 million and 24 million copies of Windows by the end of the year. According to Wall Data, Dataquest, Inc., a San Jose, Calif., market research firm, predicts that Microsoft could ship as many as 22 million copies of Windows per year by 1995.

Rumba Tools for Visual Basic is available now and costs \$195 per user license. ■

## Access for a new generation

### Attributes of future frame relay access devices:

- Ability to fully utilize high-speed lines, such as T-1, by reducing interframe gaps
- Ability to provide access to new switched services, such as Switched 384 and Switched T-1, in addition to dedicated services
- Provide bridging and routing for popular LAN protocols, such as Novell, Inc. IPX and Apple Computer, Inc. AppleTalk
- SNMP support to enable management via existing management systems

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: AMNET, INC., FRAMINGHAM, MASS.

## Vendors divided on new access devices

Some claim that current devices will suffice for frame relay access, others see new generation.

By Jim Duffy  
Senior Editor

NEW YORK — Vendors of many types of network access devices are retrofitting their wares with frame relay technology to enable users to consolidate net traffic over a single bandwidth-efficient circuit.

Because of its ability to handle bursty traffic and improved performance compared to X.25, frame relay is viewed by many as the optimum technology for funneling different types of traffic onto a corporate backbone. The technology is also attractive because it can reduce networking costs by replacing multiple dedicated lines for connecting local-area networks and terminals to remote hosts.

While some vendors claim that current devices — such as packet assembler/disassemblers, multiplexers and line concentrators — might suffice for accessing frame relay nets, some vendors claim that a new generation of integrated access system will emerge for leveraging new carrier services and providing an array of functions. They include a PAD function, multiplexing and LAN bridging and routing.

“Integrated access products that include circuit establishment and frame relay could satisfy the requirement for data and video, and even voice,” said Richard Malone, a principal at Vertical Systems Group, a market research firm in Dedham, Mass. “There’s no product like that today, but it’s coming.”

According to some vendors,

the new access devices will surpass today’s PADs and concentrators in terms of performance, provide access to high-speed switched services and bandwidth on demand, and support the Simple Network Management Protocol standard for network management.

The devices will be able to fill up multiple T-1 lines with Systems Network Architecture, X.25, asynchronous, synchronous and LAN traffic destined for a wide-area network with minimal wasted bandwidth. Most PADs used today handle speeds of 9.6K to 19.2K bit/sec and, in some cases, 56K bit/sec.

In addition to providing access to dedicated 56K and 64K bit/sec and T-1 services, the new access devices will allow users to access high-speed switched services, such as switched 56K and switched 384K bit/sec as well as switched T-1. The devices will also be able to signal the carrier network to provide extra bandwidth, or bandwidth on demand, for peak traffic loads and backup.

### Stirring debate

With the growing number of LANs and the need to interconnect them, the devices will have to support the native LAN protocols already in use at customer sites, such as Novell, Inc.’s Inter-network Packet Exchange (IPX) and Apple Computer, Inc.’s AppleTalk, and be able to route or bridge this traffic as required. Support for SNMP will allow users to view and manipulate the de-  
(continued on page 27)

## Data Packets

Ring Access, Inc. last week announced a 3274-to-3174 cluster controller adapter designed to attach older IBM 3274 controllers to IBM Token-Ring Networks.

The RA1200 adapter converts 3274 Synchronous Data Link Control data to Token-Ring Logical Link Control and eliminates the need to replace each 3274 with a personal computer or 3174.

The RA1200 has two serial ports and, when configured in multidrop mode, can support 10 serial controllers.

The adapter is currently available in single units for \$2,450 or in quantity for \$1,800. It can be shipped pre-configured for quick Token-Ring attachment.

AT&T Network Systems announced it will develop and market a new fiber interface, dubbed CommKit 3000, for connecting NCR Corp. System 3000 nodes to AT&T Datakit II Virtual Circuit Switches.

CommKit 3000 includes an I/O adapter and software that will let NCR System 3000 users access local- and wide-area networks via a Datakit switch.

The product will be available in the fourth quarter. Pricing has not been set. ■

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S. Robert Levine  
President & CEO



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# LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

## Worth Noting

**B**anyan Systems, Inc. last week announced that ComputerLand Corp. franchises will now be marketing, selling, servicing and supporting Banyan's full range of VINES networking software products.

## Netnotes

**FortuNet, Inc.** this week is expected to unveil a local-area network backup and restore product that can be used with different LAN environments.

Called Nsure, the software package will perform functions such as unattended server backup and client workstation backup/restore, and will provide a database of when backups were done and what information was backed up.

In addition, Nsure will have higher end LAN backup features such as security — providing encryption, for example, to protect data traveling across the network from the workstations or server to the storage device, especially during unattended backup.

Nsure is available now and costs \$895.

**ACC Systems** has released a product called TRI/ACC, a token-ring interface for Digital Equipment Corp. DECstations. The interface can be used to connect DEC workstations to a token ring, or it can be used in a server to give clients attached to that server access to a corporate local-area network backbone.

According to Bill Mason, director of sales at ACC, based in Columbia, Md., DEC customers previously had to use an Ethernet-to-token ring gateway to attach their workstations to token-ring nets.

TRI/ACC is available now for \$1,500. ■

## Motorola extends reach of its Altair wireless network

New bridge lets Altair networks span buildings.

By Margie Wylie  
Senior Editor

ARLINGTON HEIGHTS, Ill. — Addressing one of the classic drawbacks of wireless networking, Motorola, Inc. has announced a bridge that will allow its Altair wireless network to span buildings.

Altair, which Motorola introduced a year ago, connects computers in a work group using Ethernet adapters and radios that operate in frequencies protected from interference — unlike most wireless devices available today. Previously, work groups had to rely on wire links to connect Altair local-area networks between buildings and floors.

Due in June, the Altair Vista-

Point LAN Link package can link two Ethernet LAN segments — wired or wireless — over a maximum span of 500 feet, with a maximum throughput of 3.3M bit/sec.

The package, priced at \$11,000, consists of two line-of-sight devices, a main and remote module, software, cabling and two weatherproof antennas. No external bridges or repeaters are required, according to Motorola.

The company also introduced an improved version of its work group wireless network module that supports more connections, more users per work group, 10Base-T connections and the Simple Network Management *(continued on page 12)*

## Firm unveils CDROM drive for NetWare

By Caryn Gillooly  
Senior Editor

GERMANTOWN, Md. — Online Computer Systems, Inc. announced it is developing a version of its Opti-Net CDROM networking product for Novell, Inc. NetWare 3.11 local-area networks.

The new product, which will be a NetWare Loadable Module (NLM), will let users attach a CDROM drive to a NetWare Server, enabling users anywhere on the network to access data stored on the drive.

Additionally, the NLM will enable the server to manage the drives — such as keeping a record of which drives house which databases and defining which users can access which drives — and provide compatibility with CDROM applications running on client workstations or the server.

The Opti-Net family currently consists of Opti-Net for MS-DOS, which requires that net administrators dedicate a workstation to act as the CDROM server on the network, and Opti-Net VAP, which lets a NetWare 2.2 server support CDROM drives.

With the Opti-Net NLM, as

many as 255 Small Computer System Interface CDROM drives can be attached directly to the file server, according to Lisa Huber, manager of marketing communications at Online, based here. The NLM lets as many as 100 simultaneous user requests access the drives.

For the administrator, the software includes a console portion for centralized management of the CDROM drive and the applications accessing it.

### Growing popularity

According to Huber, the CDROM is gaining popularity in all types of industries, from education to medicine to travel.

"Each CD can hold up to 640M bytes of data," she said. "So if you were interested in mass distribution of something like an encyclopedia, you could fit 21 volumes on one CD." If that compact disc were on a campus LAN, all students accessing the campus network could access volumes of information of all types.

Doctors could keep medical books and journals on a CDROM, for example, while travel agents could access a central directory of worldwide hotel information.

The Opti-Net NLM is expected to be available in the third quarter. Although pricing was not available, Huber estimated that a 100-user license for the NLM would cost about \$1,795 — the same as a 100-user value-added process license. ■

## Managing with Macintosh

Company	Product	Price	Description
The AG Group, Inc.	EtherPeek, LocalPeek	\$795, \$495	Analyzers that decode and sort Apple's AppleTalk and other network packets; has graphical interface.
CSG Technologies, Inc.	Network SuperVisor	\$495	Mac inventory program with optional inventory control; uses Acius, Inc. 4th Dimension database.
Dayna Communications, Inc.	Network Management System	\$1,195	Modeled on SNMP, uses a hardware agent to feed statistics into a central monitor that offers sophisticated alerts.
Distributed Technologies Corp.	TalkManage	\$1,495	Lets users track network statistics from a topology map, change net parameters and analyze packets; SNMP support planned.
Farallon Computing, Inc.	PhoneNet Manager's Pack	\$1,895	A collection of utilities that concentrates on finding AppleTalk network faults and balancing network loads.
InterCon Corp.	WatchTower	\$2,495	Macintosh-based SNMP console works with any SNMP agent over TCP/IP; AppleTalk support planned.
MacVok USA	netOctopus	\$645 per 10 users	Mac inventory and remote update program works with local and dial-up links.
Neon Software, Inc.	NetMinder	\$595	LocalTalk and Ethernet versions capture and analyze packets graphically.
ON Technology, Inc.	Status*Mac	\$449 per 25 users	Remotely inventories Mac software and hardware in searchable database; future release to support SNMP.
TechWorks, Inc.	GraceLAN	\$395 per 50 users	Remote inventory software offers optional remote updating module.

Though not exhaustive, this list details some Macintosh management programs developed by non-Apple Computer, Inc. companies.

GRAPHIC BY SUSAN J. CHAMPENY

## Options exist while Macs await SNMP

SNMP support not ready yet for AppleTalk nets, but numerous vendors provide other alternatives.

By Margie Wylie  
Senior Editor

SAN FRANCISCO — Despite the fact that SNMP has made only minimal inroads into AppleTalk networks since Apple Computer, Inc. pledged to support it nearly a year ago, the Macintosh is playing host to a growing array of AppleTalk-based tools designed to keep nets running smoothly.

In some cases, existing Macintosh management tools can do more in an AppleTalk environment than most Simple Network Management Protocol management systems do today in Transmission Control Protocol/Internet Protocol and other environments.

Managers can choose from AppleTalk-based tools that do everything from taking a hardware and software inventory of every machine on the network to remotely installing updated software, drawing network schematics, reporting on network load and capturing and analyzing packets.

What they will not do, however, is integrate AppleTalk networks into multivendor net management systems, something users will only get when proposed standards for supporting

SNMP in AppleTalk environments are completed by the Internet Engineering Task Force (IETF).

Probably the most unusual category of Macintosh management applications to date, network inventory programs such as ON Technology, Inc.'s Status\*Mac, have also proven to be the most popular.

These programs capitalize on the homogeneity of high-level services available in an all-Macintosh AppleTalk network.

They let managers gather and store detailed information about the hardware and software configurations of the Macintoshes on their networks, then draw on that database to help keep applications current, enforce licensing agreements or just keep tabs on their resources.

Many vendors say their inventory programs are merely tools that manage Macintoshes and just happen to run over the network so they will not expand their features to encompass net management. Others, however, are starting to incorporate a wide range of features that target the network itself. Many have also pledged to support SNMP in future releases.

For example, CSG Technol- *(continued on page 12)*

# Options exist while Macs await SNMP

*continued from page 11*

ogies, Inc.'s Network SuperVisor generates network topology maps and alerts managers to downed network services.

Other AppleTalk-based packages more squarely address the traditional network management market with tools that keep tabs on traffic, usage, errors and other factors that determine overall network health. But even among these packages there exists a wide range of capabilities

and approaches.

Dayna Communications, Inc.'s Network Management System, for example, employs a hardware agent to send statistics back to a main management console. The program, which offers a topology map for each network segment, tracks network utilization statistics and offers a wide range of sophisticated alarms that can, for example, warn an administrator when a printer runs out of paper or when an AppleShare 3.0 server volume is full.

On the other hand, Farallon Computing, Inc.'s PhoneNET Managers Pack soft-

ware generates a topology map of an entire AppleTalk network, complete with routers, remote links and all physical segments. It gathers information about network traffic designed to help managers decide how to distribute network load. However, the program does not decode network packets.

For that function, network jockeys can turn to Macintosh-based network analyzers that work with LANs ranging from Ethernet to LocalTalk to token ring. These products offer low-level decoding of many different protocols, such as Novell, Inc.'s

Internetwork Packet Exchange (IPX) or TCP/IP, not just AppleTalk.

Somewhere between the PhoneNET Managers Pack and protocol analyzers lie tools such as The AG Group, Inc.'s Skyline/E, a \$695 program that continuously collects and graphically displays network traffic statistics by user-selected time slices.

Neon Software, Inc.'s RouterCheck, a \$649 application that lets managers gather statistics and configure routers from a number of different vendors, is a popular management package, but may be included in more general-purpose consoles when SNMP becomes the Macintosh norm.

Apple has endorsed SNMP as the standard for Macintosh management programs and is working with the IETF to create specifications for running the protocol on AppleTalk ("AppleTalk standards enter public domain," *NW*, March 9).

Managers bent on including their Macintoshes in an SNMP network today, however, do have a couple of alternatives.

InterCon Corp. of Herndon, Va., currently ships an SNMP agent for the Macintosh with its \$495 TCP/Connect II software, which connects Macintoshes to TCP/IP networks. The company's Watch-Tower, the first SNMP console available on the Macintosh, also comes with the AppleTalk SNMP agent.

Some Macintosh network routers that include TCP/IP gateways, such as Cayman Systems, Inc.'s GatorBox and Shiva Corp.'s FastPath V, also offer a basic SNMP agent today. ■

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## Motorola extends Altair wireless net

*continued from page 11*

Protocol for monitoring.

Called Altair Plus, the new system works basically the same as the previous version. User Modules connected to personal computers via Ethernet interfaces communicate with a centrally located Control Module to create a work group within a 5,000- to 50,000-ft. radius, called a microcell.

Altair Plus boosts the number of Ethernet devices a Control Module can support per microcell from 32 to 50. Each Altair Plus User Module can also accommodate as many as eight Ethernet devices.

In addition, Altair Plus now offers User Modules that support Ethernet over twisted-pair wire 10Base-T connections.

All Altair devices, including the Vista-Point LAN Link, now feature a basic Management Information Base II-compliant SNMP agent, allowing users to include the wireless portions of their LANs in their SNMP management systems. Motorola will also develop extensions to the agent that will let managers gather information about the wireless devices.

Altair Plus User Modules with thick- and thin-wire Ethernet connectors are available now for \$1,195 each. User Modules equipped with 10Base-T connectors are priced at \$1,095 each and will be available in May. The cost of Altair Plus Control Modules will remain at \$3,995 each.

After April 30, Motorola will no longer offer the old Altair User Modules and Control Modules. ■

# INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

## Worth Noting

“We firmly believe [Asynchronous Transfer Mode] will eventually enable us to meld our local, metropolitan- and wide-area networks into a single network. We’re staking much of our future on the technology.”

**Jeff Marshall**  
Managing director  
of communications  
Bear, Stearns & Company, Inc.  
New York

## Gateways help integrate SNA, internet backbones

Apertus packs include TCP/IP and LAT support.

**By Maureen Molloy**  
Staff Writer

EDEN PRAIRIE, Minn. — Apertus Technologies, Inc. last week announced three new gateways that will enable users to better integrate multiprotocol internetworks with IBM Systems Network Architecture host environments.

The gateways include the Datastar Telnet Server, which supports Transmission Control Protocol/Internet Protocol-to-IBM connections; the Datastar Down Stream Physical Unit (DSPU) Gateway for linking token-ring and Ethernet local-area networks to IBM hosts via a Synchronous Data Link Control or channel connection; and the Datastar LAT/SNA Gateway, which gives Local Area Transport (LAT) terminals access to SNA applications.

The Datastar Telnet Server is a hardware device that acts as either a Telnet server or a TN3270 server. Telnet is the TCP/IP virtual terminal protocol, while TN3270 lets a TCP/IP-based system emulate an IBM 3270 terminal.

The server gives personal computers on TCP/IP-based LANs access to IBM host-based 3270 applications. Also, it sup-

ports from 48 to 1,000 TN3270 sessions.

On the host side, the gateway supports Binary Synchronous Communications and asynchronous communications, with optional mainframe channel, token-ring, Ethernet or SDLC connections.

It also supports IBM's NetView — including SNA alerts and NetView's Response Time Monitor — as well as the Simple Network Management Protocol.

The gateway costs between \$16,405 and \$52,200, depending on the number and type of sessions.

The DSPU Gateway is a module that fits into the Datastar Telnet Server and enables users on an Ethernet or token-ring LAN to access IBM SNA resources via an SDLC or channel connection. Each DSPU Gateway module supports as many as 250 physical units, a group poll function and half- or full-duplex SDLC.

As many as seven DSPU Gateways can be configured in a single Datastar Server.

Pricing for the product starts at \$10,400 for the smallest configuration.

The Datastar LAT/SNA Gateway, another module for the Da-

(continued on page 14)

## New backplane lets Plexnet hub support more LANs

**By Joanne Cummings**  
Staff Writer

SIMI VALLEY, Calif. — Plexcom, Inc. has unveiled a new backplane for its Plexnet hub chassis that enables the hub to support as many as four local-area networks simultaneously.

The SX8000-4 backplane is now being shipped in all Plexnet-14, Plexnet-10 and Plexnet-4 chassis, and current users of those devices can upgrade to the new backplane for \$495.

Previously, the Plexnet chassis held separate cards wired together using standard LAN cables and did not support a central backplane. Now users can stick with that “rack and stack” approach or upgrade to the man-

ageable multinetwork backplane, the company said.

With the new backplane, Plexnet cards can be remotely configured to ship data to any of the four LANs supported by the backplane, whereas the rack and stack approach requires manual configuration, the company said. The four LANs can function independently and do not require separate repeaters, avoiding a single point of failure.

Available in April, the backplane comes standard with the Plexnet-4 chassis, which costs \$925, the Plexnet-10, which costs \$625 plus \$595 for a modular power supply, and the Plexnet-14, which costs \$895 plus \$795 for the power supply. ■

## SynOptics vs. 3Com: a security comparison

Features	3Com's LAN Security Architecture	SynOptics' LattisSecure
Modular hub	Yes	Yes
10Base-T support	Yes	Yes
Fiber Optic Inter-Repeater Link support	Yes	Partial
Configuration	Locally or from central console	From central console
Disconnects unauthorized stations	Yes	Yes
Device tracking history	Yes	Yes
Affected by power cycles	Yes	No
Multiple links from security cards	Yes	No
Net management security	Via media access control address	Via SNMP security string
<b>Pricing per port</b>		
12 ports	\$640	\$840
72 ports	\$277	\$276
120 ports	\$243	\$222
132 ports	Not available	\$215

GRAPHIC BY SUSAN J. CHAMPENY

SOURCES: SYNOPTICS COMMUNICATIONS, INC. AND 3COM CORP., SANTA CLARA, CALIF.

## SynOptics unveils hub-based security

LattisSecure offers hub users per-port security through scrambling technique and intruder alerts.

**By Joanne Cummings**  
Staff Writer

SANTA CLARA, Calif. — In the wake of similar announcements by 3Com Corp. and Ungermann-Bass, Inc., SynOptics Communications, Inc. last week announced a card for its 10Base-T hub that provides low-cost, port-level data security.

When used with a new management module, also announced last week, the LattisSecure card enables net managers to monitor and control end-user access to a 10Base-T Ethernet local-area network from a central console as well as ensure that data sent to certain destinations cannot be intercepted by unauthorized users, according to Bill Lanfri, vice-president of marketing at SynOptics.

LattisSecure consists of a new 10Base-T Ethernet port module, the Model 3368, which fits into SynOptics' LattisNet System 3000 intelligent wiring hub. It works with the new Model 3313S or 3314S management module to provide a security system that is manageable from either SynOptics' LattisNet Network Management Console Release 2.1 for Unix or Release 4.1 for DOS.

When a user supported by a LattisSecure module transfers a packet, the module uses a table of network addresses built from information gathered by the man-

agement module to determine the destination station.

If the destination node is attached to the same module, it forwards the packet in clear text to that port and scrambles the packet for broadcast distribution to other ports on the module and other modules in the hub.

If the destination node is supported by another secure module, the packet is scrambled for local distribution and then forwarded in clear text to the second module, which delivers it to the port address and scrambles the packet for other ports.

While it is an inexpensive way to secure ports, this approach — utilized by both SynOptics and 3Com — raises two potential problems. First, because packets pass between modules in clear text, secured modules have to be segmented by bridges from other LAN segments to prevent clear text packets from being broadcast across nonsecured modules.

Second, packets are only secured at the port level, meaning they are left in clear text when transmitted over the backplane of the device and between hubs — a potential vulnerability.

SynOptics said LattisSecure addresses this vulnerability because it can detect unauthorized intruders on the network. Thus, LattisSecure should be able to

(continued on page 14)

## Link Notes

**Crescendo Communications, Inc.** next week will unveil a new Fiber Distributed Data Interface concentrator and SBus adapter.

The FDDI concentrator, called the Crescendo 1001, is an eight-port device that supports any FDDI configuration, including single- and dual-attached links.

Available in April, the product will cost \$12,995.

Crescendo also unveiled an FDDI adapter for linking Sun Microsystems, Inc. SBus-based workstations to FDDI local-area networks.

Priced at \$2,395, the adapter will be available in May.

**3Com Corp.** has announced its NETBuilder source routing transparent (SRT) bridge for token-ring networks is now shipping. It supports source route bridging for IBM Token-Ring Networks and SRT bridging for mixed token-ring and Ethernet local-area network environments.

For more information, contact 3Com at (408) 764-5000. ■

## SynOptics unveils hub-based security

*continued from page 13*

prevent all but the most sophisticated hackers from eavesdropping on the network.

LattisSecure contains an AutoLearn feature that can learn configuration for as many as 800 nodes on a net, eliminating the need for manual configuration. The module uses this information to maintain a log detailing the sources of attempts to tap into the network and can display those

sources on the management console.

This enables a manager to prevent unauthorized access to the network by monitoring changes, such as personnel and equipment moves. If a user that is not registered in the configuration attempts to access the network, an alarm is sent to the central management station. The manager can then opt to block access to the net. Alternatively, the system can be set to automatically segment off the intruder.

LattisSecure costs about \$25 more per port than SynOptics' nonsecure 10Base-T card. On a strict per-port basis, LattisSe-

cure is less expensive than 3Com's LAN Security Architecture for configurations of more than 72 nodes, whereas 3Com's product is less expensive for hubs with less than 72 nodes (see graphic, page 13). Pricing for Ungermann-Bass' ASM 320 has not been finalized.

Available now, the Model 3368 is priced at \$1,695, which is \$200 more than SynOptics' current 10Base-T module.

### Management modules

In addition to providing the information for building the source/destination

address table, the new management module is designed to collect Ethernet error, protocol and frame-size statistics. It comes in two versions, the Model 3313S, which has one attachment unit interface port, and the Model 3314S, which has a Fiber Optic Inter-Repeater Link port that connects to the management console.

Both offerings feature a dual-processor architecture that includes a processor dedicated to capturing raw network data at high speeds and a Motorola, Inc. 68332 62-bit microprocessor that handles data analysis. By separating these functions, the modules are able to process every packet on a network, ensuring a high level of data security.

Available now, the Model 3313S is priced at \$6,995, while the Model 3314S costs \$7,395. ■

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## Gateways integrate SNA, backbones

*continued from page 13*

tastar Telnet Server and a product Apertus is reselling from Netlink, Inc., is aimed at large Digital Equipment Corp. users and enables LAT terminals to access SNA applications. It supports from 16 to 64 LAT and SNA sessions, as well as DEC VT-100, 220, 320, 330, 340 and compatible terminals.

The gateway further provides token-ring, Ethernet and SDLC host connections for SNA data running over a LAN internetwork. It also supports IBM's NetView error and informational alerts, as well as DEC management systems, such as the Terminal Service Manager for remote consoles and Remote Console Carrier consoles.

The product is priced between \$7,995 and \$12,995.

### Server introduction

Apertus also announced last week three server products that will enable users to integrate asynchronous and synchronous terminals onto LAN internetworks.

The Datastar SNA LAN Terminal Server, which can be used on Ethernet or token-ring LANs, is able to link more than 400 synchronous terminals or more than 100 ASCII terminals to an IBM host. As many as eight SNA hosts can be connected to the terminal server, providing support for a maximum of 256 logical units per host connection.

The product supports IBM's NetView and ranges in price from \$8,775 to \$63,450, depending on the number of terminals and sessions supported. It is available now.

The Datastar TCP/IP LAN Server allows as many as 224 synchronous terminals and 100 asynchronous terminals to communicate with an IBM host over Ethernet or token ring-based TCP/IP networks. It is priced between \$13,450 and \$51,650, depending on the number of terminals and sessions supported. It is currently available.

The SDLC Link Server enables users to transport SDLC data over a bridge/router-based multiprotocol internetwork, thereby eliminating the need for a separate SDLC backbone. The server allows SNA/SDLC devices to appear as LAN-attached devices to a host and supports NetView.

Available now, the product ranges in price from \$9,695 to \$18,680. ■

# GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

## Worth Noting

**S**ales of telecommunications test equipment will almost double from \$975 million last year to \$1.93 billion by 1996, according to a recent report from World Information Technologies, Inc., a Northport, N.Y., research firm.

## Regulatory Update

The **Federal Communications Commission** last week released the text of its proposal for revamping the complaint process to deal with the backlog of 977 complaints, some of which have been pending for years.

The FCC proposal suggests simplifying filing deadlines, eliminating some steps in the pleading process and reducing disputes in discovery in order to speed the process.

The FCC also suggested deciding damages after a finding of liability. Currently, disputes over damages are handled simultaneously with the investigation to establish guilt, and the FCC said haggling over money has often held up the process.

However, staffing is one important issue that was not addressed in the proposal. When the agency voted to change its complaint rules in February, FCC Chairman Alfred Sikes indicated that it would reallocate some personnel to help get the process back on track. However, in the proposal last week, nothing about personnel was mentioned.

Critics claim that until the FCC puts a high priority on resolving complaints — as might be evidenced by adding personnel — the problems will continue to plague the agency. ■

## International carriers form financial net consortium

Will market voice, data and video services globally.

By Anita Taff  
Washington Bureau Chief

WASHINGTON, D.C. — International carriers from 12 countries announced they have formed a new association to market global voice, data and video services to the financial industry worldwide.

Dubbed Financial Network Association (FNA), the group will be incorporated in Belgium at the end of the month and will sell services under the brand name Teleconnect.

Initially, members of the group will market a common set of existing services, but in the future, the FNA members said they will roll out new services geared to the financial industry.

FNA may expand beyond the initial 12 members, but the group's rules limit membership to one carrier per country. The U.S. member of the group is MCI Communications Corp. The other members are the Australian and Overseas Telecommunications Corp., Germany's Deutsche Bundespost Telekom, France Telecom, Hong Kong Telecom International, Ltd., Italy's Italcable, Japan's Kokusai Denshin Denwa

Company, Ltd., the U.K.'s Mercury Communications, Ltd., Belgium's Regie des Telegraphes et des Telephones, Singapore Telecom, Canada's Stentor and Spain's Compania Telefonica Nacional de Espana.

Although many FNA members have joint marketing alliances

**F**NA members said they will roll out new services geared to the financial industry.

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with other carriers, "what distinguishes this from other consortia is the focus on a vertical market," said Serge Wernikoff, senior vice-president of international business development at MCI.

He said FNA members believe they can benefit customers by offering a multilateral set of uniform services geared toward

(continued on page 16)

## AT&T claims net strategy hard to rank

By Anita Taff  
Washington Bureau Chief

WASHINGTON, D.C. — AT&T told the Federal Communications Commission that it cannot determine how its network technology and procedures rank against other carriers but assured the agency that it is doing everything possible to prevent outages.

The FCC required AT&T to file a report earlier this month detailing the procedures it has in place to guard against outages and comparing its procedures to those of other carriers. The agency asked for the report after AT&T suffered a major outage last September that disrupted most traffic for half of Manhattan, including air traffic control

communications for the three major airports serving the New York metropolitan area.

The Manhattan outage, which lasted about seven hours, was caused by an almost implausible string of human, technological and procedural failures that included alarms that did not work, alarms that had been disabled and staff shortages.

Frank Ianna, chief quality officer for AT&T's Network Services Division, stated in a letter attached to the report that AT&T had difficulty gathering information on procedures used by other carriers to guard against outages.

He said AT&T was forced to rely on published accounts and industry conferences. Therefore, "it is extremely difficult for AT&T to accurately appraise whether its network reliability approaches are state-of-the-art, state-of-the-industry or represent a lesser standard," the carrier stated.

AT&T also stated it believes its network procedures and equip-

(continued on page 16)

## Infonet details frame relay rollout

<b>Service:</b>	INFOLAN/FR
<b>Availability:</b>	October
<b>Network switch:</b>	Network Equipment Technologies, Inc. IDNX
<b>Coverage area:</b>	Belgium, Canada, Finland, France, Germany, Hong Kong, Netherlands, Sweden, Switzerland, the U.K. and the U.S.
<b>Port access speeds:</b>	56K/64K bit/sec in 64K increments to T-1 or E-1
<b>Pricing:</b>	Initial flat rate based on port speed and distance
<b>Integrated access:</b>	Can combine frame relay with Infonet's X.25 and public router services
<b>Scheduled beta test:</b>	This summer

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: INFONET SERVICES CORP., EL SEGUNDO, CALIF.

## Infonet details int'l frame relay service

Offering to be brought up on the same net the company uses to provide router-based services.

By Bob Wallace  
Senior Editor

EL SEGUNDO, Calif. — Infonet Services Corp. has detailed plans for a frame relay service based on Network Equipment Technologies, Inc. (NET) multiplexers that will be rolled out on three continents in October.

According to its deployment schedule, Infonet will have the broadest global reach of any frame relay provider, with nodes throughout Western Europe and North America as well as one in Hong Kong.

The frame relay service, INFO-LAN/FR, is the latest in a series of Infonet offerings designed to enable users to link geographically dispersed local-area networks using protocols such as the Transmission Control Protocol/Internet Protocol. The company also offers INFOLAN, an international router-based internetwork service.

"We will apply the valuable experience we've gained from INFOLAN to deploy a high-performance, pan-European frame relay service," said Jean-Noel Moneton, Infonet's vice-president of communications services.

Infonet is jointly owned by 11 major telecommunications administrations in Europe, the U.S. and the Asia-Pacific region.

Infonet will upgrade its existing NET IDNX backbone — which supports INFOLAN — to carry frame relay traffic by installing an additional packet engine card and adding frame relay software at each INFOLAN/FR node.

Infonet is the first service provider to offer frame relay using NET multiplexers ("Infonet in-

tros global frame relay service," NW, Feb. 3.) AT&T, CompuServe, Inc. and WilTel use StrataCom, Inc. IPX multiplexers. Cable & Wireless PLC plans to use Northern Telecom, Inc. packet switches, Sprint Corp. uses an internally developed packet switch, and MCI Communications Corp. will use a Siemens Stromberg-Carlson central office switch.

"The NET IDNX nodes we first installed in 1989 have proven ex-

**I**nfonet will have the broadest global reach of any frame relay provider.

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ceptionally reliable," Moneton said. "We are confident in our ability to meet the network availability expectations and price/performance demands of international frame relay users."

Although its ultimate goal is to introduce usage-sensitive pricing, Infonet's frame relay rollout will be based on fixed-rate pricing where users pay a single monthly fee that varies with speed and distance.

Although Infonet has established what speeds it will support, it has yet to set mileage bands but expects to have pricing set by the third quarter, Moneton said.

INFOLAN/FR will be offered at speeds ranging from 56K to

(continued on page 16)

## Infonet details int'l frame relay service

*continued from page 15*

1.544M bit/sec, or T-1, in the U.S. and from 64K to 2.048M bit/sec, or E-1, in Europe.

Infonet also remained undecided on if it will limit users to the bandwidth they subscribe to under their committed information rate (CIR), which is the minimum guaranteed bandwidth between two points. Most frame relay service providers enable users to send bursts of data above the CIR if bandwidth is available.

Although Cable & Wireless, BT North America, Inc. and others have drafted plans to deliver frame relay services overseas, none will offer it as widely in Europe. Infonet will offer service to Belgium, Finland, France, Germany, the Netherlands, Sweden, Switzerland and the U.K.

Like Cable & Wireless and BT North America, Infonet will offer its frame relay service in Canada, Hong Kong and the U.S., as well. Infonet said it will expand its inter-

national coverage next year.

The company currently has 150 points of presence in the U.S.

Randi Littencom, vice-president of marketing, said Infonet will enable users to integrate frame relay on a T-1 or E-1 access line with feeds to its other services, including INFOLAN and its X.25 service.

The company will monitor operation and performance of INFOLAN/FR from existing network control centers, Moneton said. A facility in Europe will monitor the service on that continent and a second in Southern California will be used to moni-

tor service performance in all other regions.

Infonet will begin beta-testing INFO-LAN/FR this summer but declined to identify users that will participate in the test. **■**

## Global carriers form network consortium

*continued from page 15*

unique aspects of the financial industry. For example, financial institutions have a high level of intercompany communications, Wernikoff said.

Gabriel Sidhom, director of marketing for France Telecom, agreed.

"FNA gives customers the ability to provide a uniform level of service to their company wherever [offices] are located," he said. "But more importantly, when they interact with other banks or brokerages, they have the same connectivity available."

In addition to the carriers' existing services, FNA members will begin working on

**"F**NA gives customers the ability to provide a uniform level of service to their company wherever [offices] are located."

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value-added services in the future, according to Sidhom. Although the group has not decided on any particular services yet, one example might be a common electronic mail system for banks and related firms worldwide.

Customers will be able to choose the currency in which they want bills calculated, according to Sidhom and Wernikoff.

In addition, customers can choose single or multiple billing locations, they said.

FNA members will begin announcing service availability in the second and third quarters of this year. **■**

## AT&T claims net strategy hard to rank

*continued from page 15*

ment are equal to any rival carrier and proclaimed that its net is "the most reliable, functional and versatile in the world."

In the report, AT&T provided an extensive discussion of its network technology and architecture but gave little new information from earlier reports it had filed concerning the September outage. The carrier reiterated that it intends to spend \$600 million to improve the reliability of its net by upgrading links between switches, improving diversity in the signaling network and enhancing the ability of its Digital Access and Cross-Connect System equipment to detect internal faults.

AT&T also included a study conducted by Arthur D. Little, Inc., drawn almost entirely from press accounts, describing security procedures employed by international and local carriers. **■**

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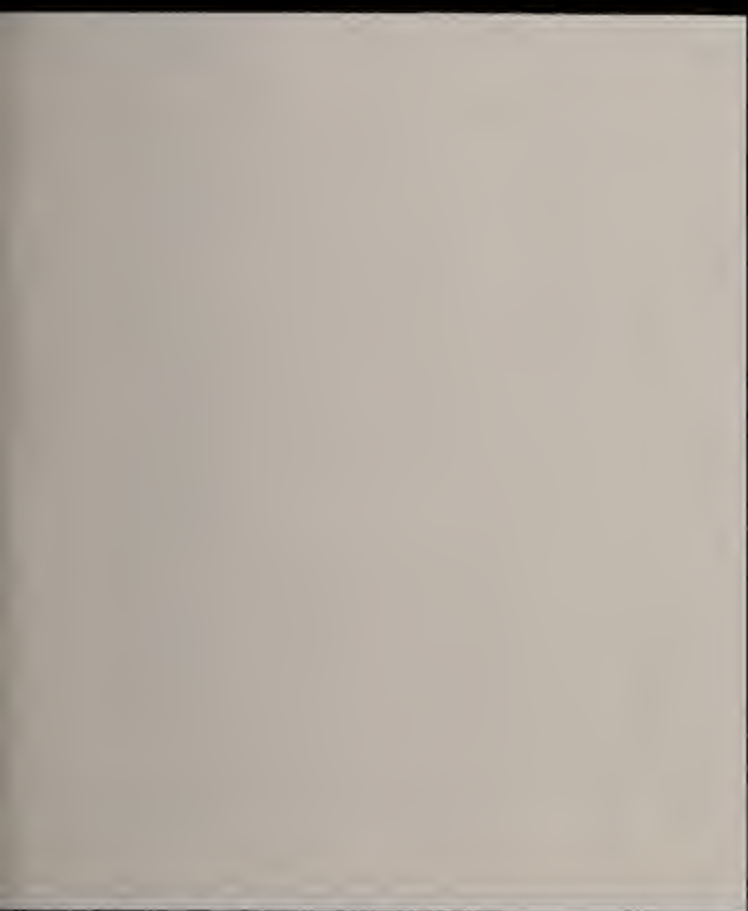
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# ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

## Worth Noting

“Companies like the [Open Software Foundation, Inc.] and Novell [Inc.] should provide common services to support distributed applications. But I don't see it happening for two to three years since most providers are still putting the basics in place.”

Joan Wrabetz  
President and chief  
executive officer  
Aggregate Computing, Inc.

## MAPI helps developers with mail-enabled applications

Microsoft releases new MAPI developers' tool kit.

By Timothy O'Brien  
West Coast Bureau Chief

REDMOND, Wash. — Microsoft Corp. has announced the availability of a tool kit for its Messaging Application Programming Interface (MAPI) that will help developers create mail-enabled applications.

At the Microsoft Mail Users Conference here, the company said the release of the MAPI tool kit was important because developers will now be able to build messaging functions into applications that will enable users to send mail from popular desktop programs.

“This is a real thing,” said Daniel Petrie, general manager of the work group division at Microsoft. “It's happening. In the next three to four months, you'll see products shipping that already support MAPI.”

The first version of the Software Developer's Kit for MAPI will contain dynamic link libraries (DLL), system extensions from the Microsoft Windows op-

erating system that include MAPI calls. As a result, any development tool that can make DLL calls can now create messaging applications.

MAPI, announced by Microsoft last fall, was originally designed to be a set of messaging function calls that enable users of Windows-based applications to transparently access various messaging services.

However, at the conference, Microsoft outlined its plan to make MAPI available for more than just Windows, saying it is targeting three other platforms by year end — DOS, Apple Computer, Inc.'s Macintosh and OS/2.

According to Petrie, these latest moves show that Microsoft recognizes that cross-platform support is vital for MAPI's acceptance.

To show MAPI's support of mail systems other than Microsoft Mail, the company demonstrated MAPI at the Electronic Mail Association meeting in Los Angeles. (continued on page 19)

## Check image system helps bank simplify statements

By Joanne Cummings  
Staff Writer

BOSTON — BayBanks, Inc. is using a new host-based check imaging system to simplify its customer's monthly statements.

The system, called CheckView, provides customers with pictures of their canceled checks, rather than the checks themselves, in their monthly statements. “CheckView lets customers review their checks at a glance,” said Lindsey Lawrence, president of BayBanks, based here. “With CheckView, BayBanks' customers can save time by not having to sort through their checks each month.”

When the system went on-line last month, BayBanks became the first bank in the Northeast to offer check imaging to its customers.

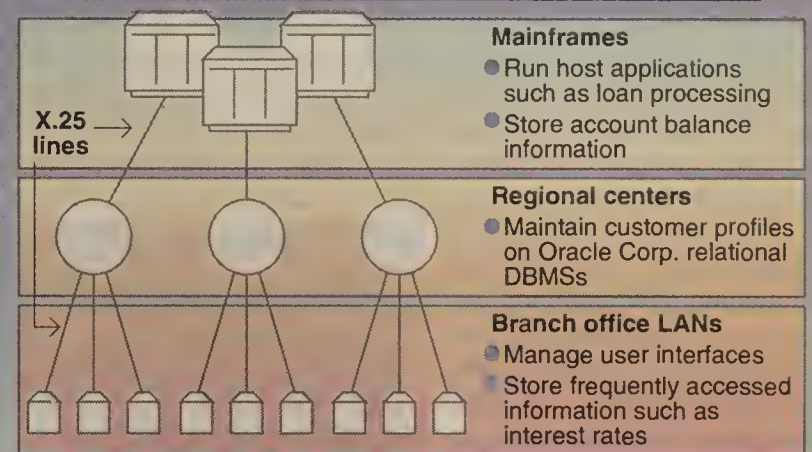
“Other banks have talked about offering such a service,” Lawrence said. “We're the first to make it an actual service.”

The heart of BayBanks' imaging system is BancTec Systems, Inc.'s ImageFirst 5500, a device that can digitize as many as 1,000 check images per minute. The ImageFirst 5500 then passes the images to an IBM mainframe for storage.

According to Lawrence, the bank is utilizing the same direct-access storage devices they used previously. “We weren't required to buy any different type of disk storage for this,” she said.

BayBanks is also using a host-based imaging application from Cincinnati Bell Information Systems, Inc., called ImageBanc, that manages stored images and formats them for printing on pages containing 18 checks each. BayBanks did not have to rewrite its existing customer statement application in order to accommodate the check imaging system because ImageBanc works directly with it to insert the image state- (continued on page 18)

## French bank embraces client/server



Credit Lyonnais is replacing stand-alone minicomputers with a new client/server net, dubbed Elan, to support its branch operations.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: CREDIT LYONNAIS, PARIS

## Client/server net to boost bank's power

Elan links employees to more than 1,700 branch offices with relational DBMSs for financial info.

By Barton Crockett  
Senior Editor

PARIS — Following the credo that “knowledge is power,” banking giant Credit Lyonnais is installing a client/server-based network that integrates previously inaccessible customer information into on-line databases used by thousands of employees to sell bank services.

The new Elan network gives bank employees in more than 1,700 branch offices access to relational database management systems with detailed personal and financial data about customers. Employees use this information to sell new services to existing customers and automate paper-intensive procedures that waste nearly a third of the average branch worker's time, said Jacky Grinenwald, an information systems manager for the French banking giant.

“The main objective is to make the bank more competitive,” Grinenwald said in an interview at Credit Lyonnais headquarters here. “Elan allows employees to spend more time on commercial, instead of administrative, jobs.”

### Multiyear project

Grinenwald said Credit Lyonnais began working on Elan in 1985. The bank, which ranks among the world's 10 largest, expects to finish building the net within two years.

Elan consists of local-area networks in the bank's branch of-

fices that are linked via dedicated analog lines to Stratus Computer, Inc. minicomputers in 18 regional offices.

The minicomputers are linked to each other via multiple digital private lines and to IBM mainframes in data centers in Lyons, Paris and Tours, France.

The LANs in the branch offices manage the user interface for most branch applications and store frequently accessed information such as interest rates. The minicomputers run Oracle Corp. relational DBMSs with personal and financial profiles of Credit Lyonnais customers. The mainframes run applications such as loan processing and are the official repository of account balance information (see graphic, this page).

### Replacing minicomputers

Elan replaces stand-alone minicomputers that supported most branch applications. The Oracle DBMSs make it possible to compile customer information into central databases that branch employees can access. Previously, that information was contained in multiple, incompatible databases that were inaccessible by branch employees.

According to Grinenwald, about half the applications expected to run on Elan are now up and running at more than 1,700 of the bank's 2,000 French branch offices. The rest of the applications will be brought up (continued on page 19)

## Store & Forward

Soft-Switch, Inc. last week said it plans to enable its Soft-Switch Central electronic mail gateway to send and receive messages over the Ardis radio network. The vendor is expected to deliver the Ardis link this summer.

Ardis is a joint venture of IBM and Motorola, Inc.

OSIware, Inc. of Vancouver has announced a new version of its X.400 electronic mail software for MS-DOS personal computers based on Microsoft Corp. Windows to support the 1988 version of the X.400 standard.

The software, Messenger 400 Remote User Agent, costs \$450 per license.

CE Software Holdings, Inc. has announced plans to support the Vendor Independent Messaging (VIM) interface on its QuickMail messaging software for Apple Computer, Inc. Macintoshes. VIM is an application program interface that rivals Microsoft Corp.'s Messaging Application Programming Interface. ■

# Windows tools debut for automating support centers

By Wayne Eckerson  
Senior Editor

NEW ORLEANS — A slew of vendors used the recent 1992 International Help Desk Conference here to introduce Microsoft Corp. Windows-based software products for automating customer support centers.

The following is a sampling of products announced at the show: ■ Hammersly Technology Partners, Inc. launched a Windows-based help tool containing four integrated modules that perform call logging, inventory management, training scheduling and systems administration. The product, called Utopia, comes with a case-based expert system that lets operators search past trouble tickets to find one that closely matches the symptoms of the current trouble ticket. Operators can skim through the earlier trouble tickets to find a resolution to a caller's problem.

■ MGV Computer Consulting, Inc. of Toronto announced MGV HelpDesk, an automated call logging and tracking software package that uses Windows and Sybase, Inc.'s SQL Server database.

## Imaging system helps bank

*continued from page 17*  
ments into each customer's monthly statement.

"We've been very pleased operationally with the whole process," Lawrence said. "We were able to decide when we wanted to do it and achieve our target, which is not always the case with new technology."

The bank has already seen some benefits from the new system. Although Lawrence declined to provide specific figures, she said the bank has seen a considerable savings in postage costs because statements mailed with imaged checks are lighter than those mailed with bundles of paper checks.

Also, BayBanks no longer has to store paper checks. "Now all checks can be stored on microfiche, which takes up less space and is more efficient than storing paper checks," Lawrence said.

Additionally, the imaging application is garnering new customers. "[The application] differentiates us because we're striving to offer customers the most convenience," she said. "People don't realize it initially, but keeping 18 checks on a piece of paper is really very convenient. Everything's together in one place." ■

this summer, will cost \$60,000.

■ InterApps, Inc. of Hermosa Beach, Calif., announced Dominion, an integrated suite of nine applications to manage such areas as trouble ticketing, inventory, financial information, customer data and moves, adds and changes.

The software allows users to annotate files with full-motion video, sound and images. Dominion also supports Microsoft's Dynamic Data Exchange for linking

Dominion applications to external programs, such as spreadsheets or graphics files.

■ Ameritech Information Systems announced a Unix-based application called the Ameritech Intelligent Help Desk Solution. Using artificial intelligence, the software searches a knowledge base of key words and returns solutions for given symptoms. It also indicates all devices within a company adversely affected by any problem or change to a given

system or network component.

The Intelligent Help Desk Solution supports links to other diagnostic tools, including two Ameritech products that let operators diagnose IBM Systems Network Architecture nets and troubleshoot Simple Network Management Protocol and token-ring nets. The system is being rolled out to support 65,000 Ameritech users. The product will be commercially available in April. ■



© 1991 AT&T

## Client/server net boosts power

*continued from page 17*

within three years.

Profiles of about 10% of Credit Lyonnais customers are now stored in the DBMSs. But about 90% of the bank's customer profiles should be entered into the Oracle DBMSs within 18 months.

Grinenwald said Elan improves branch productivity by enabling staff to spend more time

selling services to customers. For example, when a customer deposits a check, Elan pulls down that customer's profile from an Oracle DBMS and displays it on a teller's computer screen.

The teller can use the information to determine if the customer is a candidate for another bank service, and offer that service to the customer.

Elan also brings automation for the first time to customer service representatives, who previ-

ously wasted a third of their time shuffling paper.

Grinenwald said Credit Lyonnais expects to spend about 1.5 billion in French francs (\$265 million U.S.) on hardware and off-the-shelf software for Elan. The bank is also investing about 400 man-years of effort to build custom applications for the net.

But Grinenwald claimed that the productivity and marketing improvements are worth the expense. He said Elan will put Credit

Lyonnais ahead of other banks, which are also looking to compile customer information into a central set of DBMSs and install LANs in branch offices.

"Other banks say they have nearly the same capability, but when you look into it, you see we're doing it on a much larger scale," he said. "From a technical point of view, we think we are advanced."

But Ladd Willis, managing vice-president at First Manhattan

Consulting Group in New York, which advises banks on strategic issues, said most leading banks have spent the past six years developing nets and centralized customer DBMSs similar to Elan.

He added that some U.S. banks, including BankAmerica Corp. and Citicorp, are even moving past Credit Lyonnais by using supercomputers to analyze customer data in central DBMSs to develop innovative services and marketing strategies. ■

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## MAPI develops mail uses

*continued from page 17*

Angeles last week as the interface linking two Lotus Development Corp. products — Windows-based word processor Ami Pro at the front end and cc:Mail E-mail engine at the back end.

"The message here was very clear," explained Rick Segal, a Microsoft employee who operates under the title of technical evangelist. "We wanted to show that MAPI is a solution at the operating system level and not just an attempt by Microsoft to sell its own mail."

Microsoft will be making the MAPI developers' kit available during an eight-city promotional tour that will run from March 30 through April 3. In addition, the MAPI specification is available on CompuServe, Inc. networks.

At the first MAPI Developer's Conference, to be held here in July, Microsoft will distribute developers' tool kit code to attending developers and demonstrate applications that already use MAPI.

Separately, Microsoft also announced the availability of an SQL Server Resource Kit, a compilation of the most recent utility programs and technical information for its SQL Server Version 4.2.

The kit is intended to make technical information on SQL Server more readily available and help Microsoft customers leverage Windows' power in implementing client/server applications.

Contents of the SQL Server Resource Kit include comprehensive technical information on how to build client/server applications using some of the new SQL Server features, such as cursor control or the optimizer capability.

The kit also contains utilities that network administrators can use to graphically monitor CPU utilization of SQL Server and provides examples of how to write code for Windows/SQL Server configurations.

The SQL Server Resource Kit costs \$149 and is available now. ■

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# INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

## Worth Noting

**T**elecommunications service rates rose in the fourth quarter of 1991, the third consecutive quarter that rates have grown, according to the Center for Communications Management Information (CCMI), a Rockville, Md., market research firm. CCMI's Telecommunications Price Index, which was set at 100 in 1984, rose .1% in that quarter to 70.4.

## People & Positions

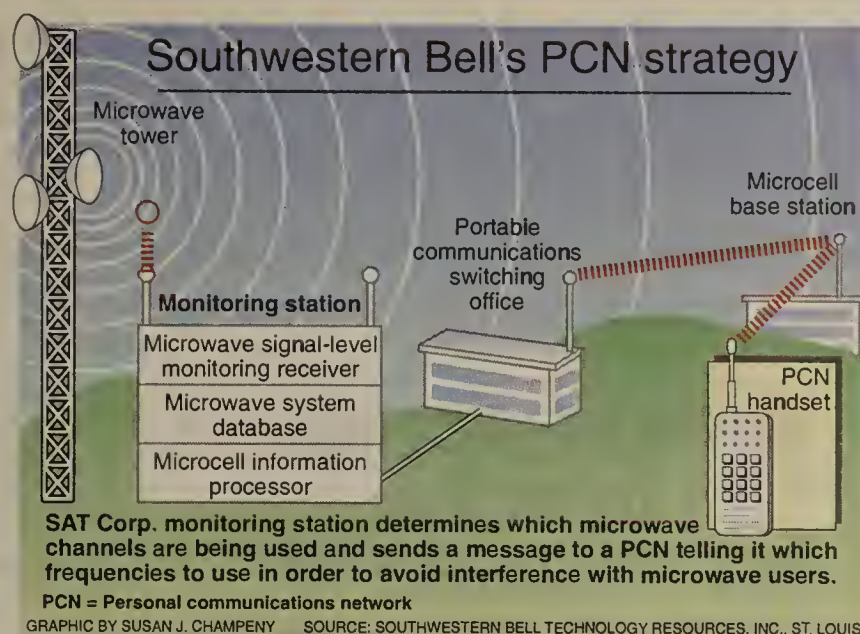
**Crescendo Communications, Inc.**, a Sunnyvale, Calif., maker of Fiber Distributed Data Interface network products, last week named two new vice-presidents to its sales and marketing group.

**Jayshree Ullal** has been named vice-president of marketing. She will be responsible for strategic and product marketing activities. Previously, Ullal was director of Unger-mann-Bass, Inc.'s internet-working business unit.

**Harry Quackenboss** has been named to the newly created position of vice-president of sales. He will manage U.S. and international sales, including OEM and reseller channels. Previously, Quackenboss was vice-president of OEM operations at Sequent Computer Systems.

**Micom Communications Corp.**, a Simi Valley, Calif., data and voice communications equipment maker, recently named **Barry Phelps** chairman and chief executive officer.

(continued on page 22)



## Southwestern Bell plans to test PCN spectrum sharing

RBHC to trial SAT monitoring device in Houston.

By Ellen Messmer  
Washington Correspondent

ST. LOUIS — Southwestern Bell Corp. has selected SAT Corp. to build a spectrum-monitoring device for a personal communications network (PCN) test this fall to prove spectrum sharing between PCN systems and microwave users is feasible.

Southwestern Bell will test the PCN system in Houston with microwave users operating networks in the 1850-MHz to 1990-MHz frequency band. The SAT monitoring device is intended to show that Southwestern Bell can exert precise control over individual PCN microwave base stations so they do not interfere with microwave nets.

Successful completion of the test would offer evidence that spectrum coexistence is possible and give Southwestern Bell, which is eager to enter the PCN business, a good chance at winning a "pioneer's preference" license from the Federal Communications Commission. The FCC has said it intends to grant these licenses to a few companies that can demonstrate innovations in PCN technology.

Past experience, however, has shown that interference problems can be nettlesome. A test that was run between a PCN provider in Houston and local microwave users showed severe interference problems ("FCC brands radio frequency sharing test inconclusive," *NW*, Aug. 26, 1991).

Henry Towster, director of strategic business development at Southwestern Bell Personal

Communications, said the SAT device will be based on a design concept called Intelligent Multiple Access Spectrum Sharing (IMASS).

Under Southwestern Bell's IMASS design, each monitoring station will contain pencil-sized antennas capable of picking up channel use in the vicinity of point-to-point microwave beams (see graphic, this page).

The monitoring station will collect information, process it and send instructions on spectrum usage via a terrestrial or wireless route to the Southwestern Bell portable communications switching office.

This switching office, similar to cellular switching centers used today, will be able to use the information to dynamically adjust the frequency range of the PCN base stations broadcasting to users' PCN telephones so microwave and PCN systems are never operating on the exact same frequency at the same time.

Michael McNab, marketing manager at Sunnyvale, Calif.-based SAT, said his company is contracted to deliver four prototypes of the monitoring station to Southwestern Bell. He described SAT as a value-added business partner of Hewlett-Packard Co. that takes HP spectrum analyzers and computers and integrates them to create systems to monitor the quality of traffic on satellite systems.

McNab said the challenge will be ensuring that the monitoring stations accurately inform the PCN microcell base station which frequencies are available. ■

## IDB to buy carriers from TeleColumbus

Adding the resources of WorldCom and STARS will give IDB about 7% of global private-line mart.

By Bob Brown  
Senior Editor

LOS ANGELES — IDB Communications Group, Inc., a provider of domestic and international satellite services, recently agreed to acquire international carriers World Communications, Inc. (WorldCom) and Houston International Teleport, Inc. from TeleColumbus AG of Baden, Switzerland.

Under the multitiered agreement, which is scheduled to be completed by year end, IDB will exchange 40% of its stock, worth about \$100 million, for 100% ownership of WorldCom and Houston International Teleport, also known as Satellite Transmission and Reception Specialists (STARS). The agreement calls for IDB, based here, to begin managing WorldCom on April 1, pending Federal Communications Commission approval.

After completion of the acquisition, WorldCom will be called IDB-WorldCom and STARS' services will be marketed under the STARS brand name as an IDB-WorldCom service offering. All the firms' European activities will be combined into a new organization called IDB-WorldCom AG, based in Bern, Switzerland.

The acquisition signals further consolidation in the international market, a shakeout resulting from carriers such as AT&T pressuring smaller players by bundling international services with domestic offerings and selling them at discounted prices. To compete, smaller carriers have been forced to seek partners.

Franz-Anton Glaser, chairman and chief executive officer of TeleColumbus, said the acquisition should boost user confidence in WorldCom's long-term financial stability. TeleColumbus has pumped millions of dollars into

(continued on page 22)

## INDUSTRY BRIEFS

**Novell unveils international changes.** Novell, Inc. last week reorganized its Corporate Services Group as part of an effort to improve sales, engineering and support services.

Under the realignment, Gregory Fallon has been named vice-president of international sales, reporting to Mary Burnside, executive vice-president in charge of Novell's Corporate Services Group. Novell recently consolidated worldwide sales under the Corporate Services Group.

Fallon will be responsible for international sales and operations in 13 countries outside North America. Previously, he was channel marketing director for international operations.

Novell also said it is building a centralized support organization for European users in Dusseldorf, Germany. The group will provide telephone-based support to Novell resellers and users in Europe.

**BellSouth, Dow Jones to test info service.** BellSouth Corp. and Dow Jones & Company, Inc. last week began testing a new voice-based information service for cellular telephone users.

The Personal Info Clips service includes customized, up-to-date news on business, stocks, sports and weather, among other topics. It will be based on BellSouth's cellular network and use information supplied by Dow Jones' Voice Information Network news retrieval service. The service will be tested in Los Angeles with as many as 5,000 mobile communications users between now and June and rolled out in other BellSouth cellular markets, depending on how the test goes. ■

## IDB to buy carriers from TeleColumbus

*continued from page 21*

WorldCom only to see the company lose millions amid fierce competition that has put the squeeze on profits, he said.

WorldCom, based in New York City, is one of the largest U.S. providers of international private-line services to Europe and other parts of the world, largely via fiber links. The firm, which generated \$90 million in revenue last year, has been seeking partners for a while and nearly struck a

deal with WilTel several months ago.

STARS operates a fiber net in Houston that provides shared access to the carrier's satellite facilities, which are used for broadcast traffic offerings, as well as domestic and international private-line voice, video and data services. Users can also access the satellite-based services via microwave. The company, which posted revenue of \$21 million last year, specializes in private-line services to Mexico, Central and South America, and Europe.

IDB operates a domestic and international satellite-based network that sup-

ports radio and television transmission services, international private-line services and, most recently, switched international long-haul services. The carrier has major teleports in Los Angeles and New York and about 80 more earth stations scattered across North America that serve as gateways to its satellite net.

The company, which reported \$104.4 million in revenue last year, has been doing well because of its efforts to provide links to hard-to-reach locations, such as the former East Bloc countries. IDB also offers service to Israel and Mexico, among

other countries.

The acquisition of WorldCom and STARS more than doubles the size of IDB, but the size of the combined companies still pales in comparison to the largest international private-line carriers, said Ronald Eward, president of MarTech Strategies, Inc., an Indialantic, Fla., market research firm that tracks users' global private networks.

IDB, STARS and WorldCom combined account for about 7% of the market, which is roughly the same share held by TRT/FTC Communications, Inc., Eward said. That puts IDB far behind AT&T, which holds about 50% of the market, as well as MCI International, Inc. and Sprint International, he added.

Still, increasing the size of IDB by adding WorldCom and STARS is significant for the carriers and their customers, according to Eward. "The combined carriers will have more resources to draw from to develop new services and markets," he said.

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The acquisition of WorldCom and STARS more than doubles the size of IDB, but the size of the combined companies still pales in comparison to the largest international carriers.



According to Glaser, the other major benefit of the acquisition is that the combined IDB, STARS and WorldCom network will be more redundant than each company's separate net. Whereas IDB's network consists largely of satellite facilities, WorldCom's net is mostly fiber, he said.

"That will allow IDB to switch users over to fiber if something goes wrong with the satellite network," and vice versa, Glaser said.

Eward agreed that improved redundancy will result. "IDB needed the fiber," he said. "The fiber can be used for alternate routing and backup." ■

## People & Positions

*continued from page 21*

The chairman's post previously was vacant. Phelps takes over the CEO responsibilities from **Gil Cabral**, who is the company's president and was recently named its chief operating officer.

Previously, Phelps was Micom's chief financial officer. **Fran Good** has been named to replace him in that position.

**Rich Products Corp.** has named **Michael Sellitto** as manager of telecommunications for the company's Information Services Department. He will be responsible for strategic planning and control of all telecommunications technology applications at Rich. Sellitto is also a telecommunications instructor at the State University of New York at Buffalo and a senior member of its Telecommunications Program Instructor's Steering Committee. ■

# MANAGEMENT STRATEGIES

ENTERPRISE NETWORK STRATEGIES, USER GROUPS AND MANAGING PEOPLE AND TECHNOLOGY

## Dialogue

**Will wireless technology have any affect on your future network plans?**

“Wireless technology holds a lot of promise for hospitals because everyone is on the move, from administrators to physicians to patients. Our inclination is that [wireless technology] would be a real natural for health care. It matches our profile well.”

**Dick Bretagne**

Chief information officer  
Northwestern Memorial Hospital  
Chicago

“Wireless technology is still wandering around in its infancy because it doesn't yet — and I think 'yet' is the operative word here — support the higher bandwidths it needs to stick long term.

“Most wireless is running at 2M bit/sec, and that just isn't fast enough. We're currently looking at it, but we're concerned about that bandwidth limitation. If it gets up to about 16M bit/sec, it would be perfect for branch banking, especially when wiring a teller line.”

**George Mattingly**

Senior vice-president and  
director of telecommunications  
First Union Corp.  
Charlotte, N.C.

“We are watching [wireless] like a hawk. It's a little too expensive right now, but we're hoping that it eventually competes with wiring in price.

“We believe that wireless can help us in the area of local-area networks and voice applications. And with the LAN angle, you automatically get coverage for video-type applications. When you're building a new office area, moving or rearranging, wiring is a constant hassle. We see wireless as a solution.

“Some of the wireless applications are not as high speed as Ethernet or FDDI, but the only other concern might be that we are sending corporate secrets out the window.”

**John Crankshaw**

Manager of telecommunications  
Steelcase, Inc.  
Grand Rapids, Mich.

## Network ills require careful diagnosis, medicinal mix

Administrators advised to get to root of problem.

By Eric Schmall  
Special to Network World

In his book on customer service, *Close to the Customer*, James Donnelly Jr. advises managers to learn an important concept taught to fledgling medical students: Never treat a condition as a disease.

Donnelly explains that physicians encounter two basic types of patients — those they can cure and those they cannot. This seemingly obvious statement helps them distinguish between the two methods for treating patients.

Physicians can cure some medical problems, such as broken bones and appendicitis, by following established medical procedures. Other medical problems, however, such as allergies and hypertension, are medical conditions that can be treated and mitigated but never completely eliminated.

Treating a patient's condition

requires a cooperative effort between the physician and the patient, who must accept greater responsibility for managing his health. Medical professionals know that trying to cure a condition wastes time and money.

### The diagnostic approach

In the business world, managers need to learn the same lesson, according to Donnelly. Unfortunately, most of us were taught to be problem solvers, and consequently, we approach every business issue as if it had a cure.

Sometimes this method works. After all, it can be relatively simple to solve some things by adding resources, such as time, people or money, to the equation.

In other cases, the prescription might be to remove a harmful influence that could appear as a reassignment, reorganization or dismissal.

(continued on page 26)

## EXECUTIVE BRIEFS

BY WAYNE ECKERSON

**Networks shine in IS budgets.** Information systems (IS) budgets for 1992 will show modest growth, rising an average of 4% from the previous year. One-third (34%) of IS departments will spend the same as last year, 43% will increase spending and 23% will have smaller budgets, according to a survey of 1,800 IS professionals in 23 industries that was conducted by the Business Research Group of Newton, Mass.

The health care industry will outpace all others with a healthy 8.4% budget increase, while discrete manufacturing and finance will trail the pack posting only a 2.5% budget boost.

The fastest growing budget item will be for networking equipment, such as bridges, routers and hubs. Expenditures on networking will increase 5.1%. Companies will spend 4.4% more on hardware, 4.2% more on software and only 1% more on personnel.

**NIST releases security guide.** The National Institute of Standards and Technology has published a guide that outlines how to set up a rapid response team for responding to computer viruses and other information security threats. “Establishing a Computer Security Incident Response Capability” describes the organizational, technical and legal issues involved in setting up a rapid response team.

The guide is geared toward federal agencies but is applicable to other organizations. It can be obtained by sending \$3 to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The stock number of the guide is SN 003-003-03121-6. ■

## Managing the outsourcing transition

EDS uses a phased approach to manage employee transfers from outsourcing deals.

### Before contract is signed:

- Staff members from EDS and the user company negotiate benefits, compensation and personnel policies for transferred employees.
- All discussions are highly confidential.

### After contract is signed:

- EDS sets up a transition site close to where most transferred employees will work.
- A cadre of long-time EDS staffers runs open discussion groups and meets individually with transferred employees.
- EDS holds training sessions on EDS' benefits and policies and provides hot lines that employees can call with questions.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: ELECTRONIC DATA SYSTEMS CORP., DALLAS

## Outsourcing: tending to the people issues

Essential to carefully plan personnel swap-over and be candid on how moves will affect staffers.

By Wayne Eckerson  
Senior Editor

DALLAS — The key to making an outsourcing deal work often depends on how well companies manage the transfer of employees from one firm to another.

No company understands that better than Electronic Data Systems Corp. (EDS), which has perhaps negotiated more outsourcing deals than any other service provider in the world.

In 1991 alone, EDS signed outsourcing deals with McDonnell Douglas Corp., Continental Airlines Corp. and Blue Cross and Blue Shield of Massachusetts. Each deal involved the transfer of hundreds, if not thousands, of employees to EDS' payroll. Today, about 25% of its employees come from companies that have outsourced part or all of their information systems (IS) or network functions.

Not surprisingly, EDS has established a well-defined strategy for managing the transfer of employees and IS operations to EDS. Although each outsourcing deal is unique and must be handled differently, the key to any successful transition involves rigorous planning followed by open and frank discussions with workers about how the deal will affect them both in the near and long term, according to EDS staffers.

### Emphasis on communication

“We almost try to overcommunicate with workers,” said Rusty Gaston, a vice-president at EDS here. “This helps reduce their fears about the future and

dispels false or misleading rumors.”

EDS has broken down the transition process into three phases (see graphic, this page). In the pretransition phase — which spans three weeks to six months, depending on the nature of the outsourcing arrangement — a small group of EDS staffers meets regularly with managers of the customer to hash out details regarding benefits, compensation and personnel policies.

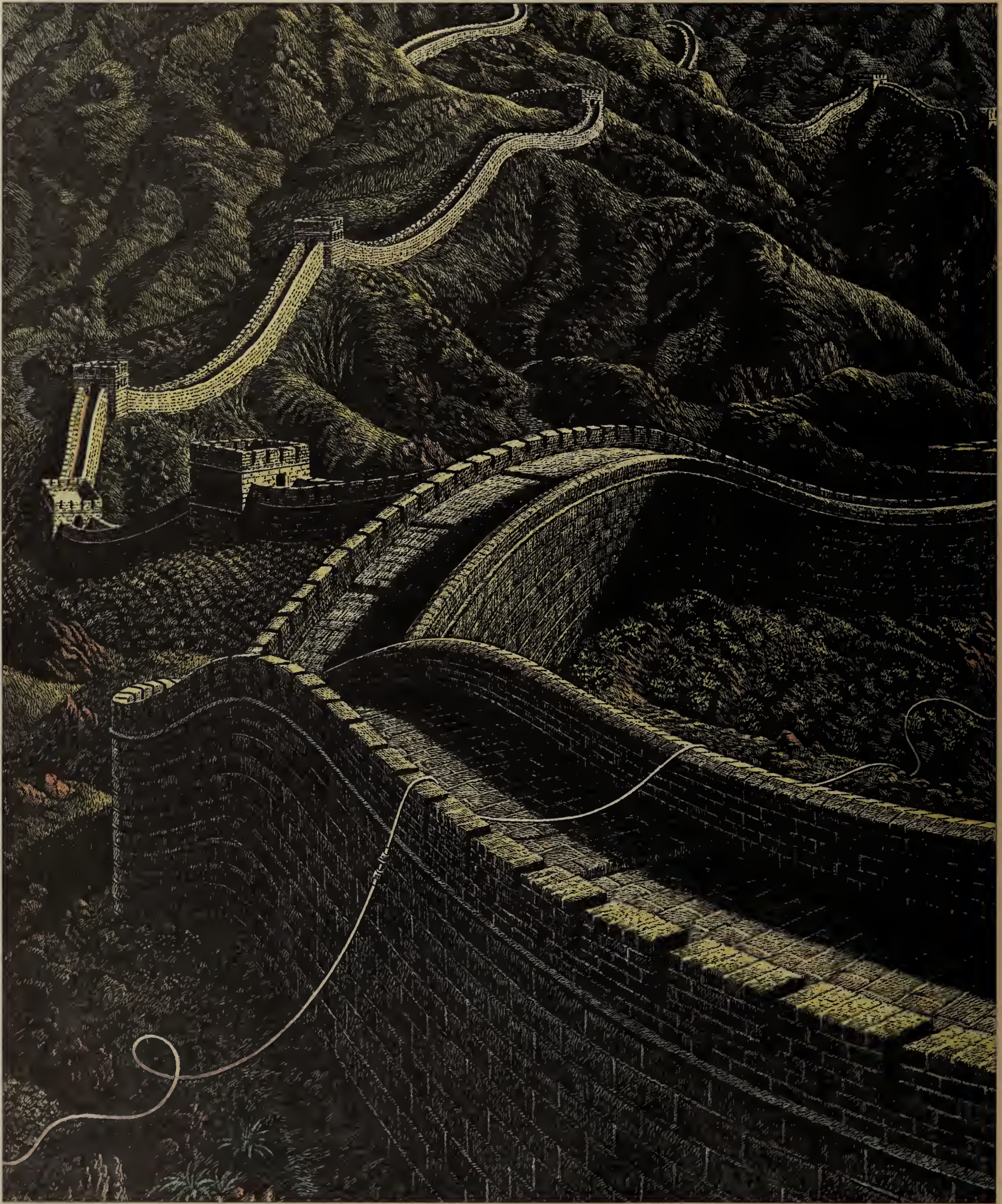
EDS tries to ensure that transferred employees maintain the same or better benefits and compensation. For example, an employee with 15 years of service would be credited with the same number of years at EDS when calculating retirement benefits, Gaston said.

Once a deal is signed, EDS sends in a squadron of experienced staffers to facilitate group discussions, meet with employees individually and man hot lines that employees can call with questions, he said.

In the deal with Blue Cross and Blue Shield, EDS flew in more than 200 employees who spent five days assisting in the transition phase.

During the posttransition phase, one or two EDS personnel remain on-site to continue answering employee questions, resolve any problems or questions that may arise with the first issuance of EDS paychecks, and initiate a training and education program for all transitioned employees. Most of the new EDS

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## Outsourcing: tending to the people issues

*continued from page 23*

workers will spend a week or more in classes on-site or at EDS' headquarters learning about the company's values, mission and approach. Many also receive technical training.

While EDS does not promise workers that they will stay in their current posi-

for Blue Cross and Blue Shield.

"In essence, transitioned employees start at EDS with a clean slate and the opportunity to perform. We don't acquire or look at employee files," said Moore, who is a transitioned employee. She had worked for McDonnell Douglas before EDS acquired the aerospace firm's systems integration division.

After an outsourcing deal is completed, EDS assesses the user company's operations, looking for redundancy and overlap. If EDS eliminates an employee's position, it will reassign that person to another EDS

account as close by as possible. Because of EDS' size, that is usually not a problem. In New England, for example, EDS has six divisions and 16 accounts.

EDS has also established satellite systems engineering centers in regions where they have excess employees. Workers at these centers handle jobs all over the country that can be managed remotely by dialing into computers or talking to clients via telephone.

But EDS does not always reduce staff when it takes over a company's IS operations. Sometimes, EDS has to bring in em-

ployees to prop up a particular area in a user's operation or carry out a major systems initiative, Gaston said.

Many transitioned employees often choose to relocate to other parts of the country in order to take advantage of job opportunities within EDS.

"Once employees get past their initial fears, many find that being outsourced was a positive event in their careers," Gaston said. "EDS is such a big company that technical people have more opportunities for advancement and challenge than at a user company." ■

“Once employees get past their initial fears, many find that being outsourced was a positive event in their careers,” Gaston said.

▲▲▲

tions, it does make a commitment to keep them on the payroll as long as they are competent workers, according to Elaine Moore, a human resource manager at EDS who helped manage the transition process

## Network ills require careful diagnosis


*continued from page 23*

Yet there are some things that defy all remedies. Managers can expend enormous amounts of time and resources to little avail trying to improve such business intangibles as productivity, quality, performance and corporate culture. There are no quick fixes to problems in these areas. Those issues only respond to continuous treatment, fine-tuning and tweaking. Like medical conditions, they require a balanced, cooperative effort between the manager and the affected employees.

In the information systems arena, network managers can make the same mistake of assuming that all problems have solutions. Vendors encourage such thinking and promote their products as effective elixirs for whatever ails the network. Certainly, there are issues, such as excessive response times or call blockages, that can be easily remedied with standard “medicines,” including increased line speeds or additional trunking.

But other areas do not have easy, permanent solutions. These include building a robust network management system establishing standards or creating a fair chargeback system for network services. There is much a net manager can do to alleviate problems in these areas, but there is no one right or perfect solution that will overcome every situation.

In these instances, network managers need to work closely with end users, just as physicians need to consult routinely with patients to review their condition. For example, instead of trying to make networks interoperate by buying one vendor's equipment, net managers should work with users and educate them about purchasing equipment that may not easily interoperate with existing systems. ■



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## DEC preps ACA with Sun, Windows

*continued from page 9*

for Sun and Windows applications helps DEC fulfill its promise to make ACA Services available on multiple platforms, analysts said.

The new version also implements elements of the Object Management Group's Common Object Request Broker Architecture, which enables applications from multiple vendors on disparate hardware platforms to exchange information in an

object-oriented environment. It also supports Microsoft's Dynamic Data Exchange technology, which allows ACA Services to launch Microsoft personal computer applications across the net.

ACA Services, which is targeted at large MIS shops and systems integrators, allows users to build distributed computing systems by enabling new and existing applications to communicate and share information without rewriting application code, according to DEC.

"It has the ability to take legacy applications distributed across multiple plat-

forms and off-the-shelf software to form a cross-functional, integrated view of the business," said Les Apigian, DEC's systems integration manager for electronic publishing systems. "This hits right at home with MIS shops."

Fisher Controls International, Inc., a supplier of manufacturing control systems in Austin, Texas, is using DEC's @aGlance software, a manufacturing-specific application based on ACA Services. The company uses the software to let its Windows spreadsheets in the engineering room gather data from VMS systems on the plant

floor, according to Alan Pederson, senior design engineer at Fisher.

ACA Services can transport data from Sun, Windows, VMS and Ultrix applications via TCP/IP. Data from Windows, Ultrix and VMS applications can be transported via DECnet/OSI, as well.

ACA Services Version 2.1, which will be available in May, is priced at \$100 for a single-user license for Windows and \$500 for a developer's kit.

The software for Sun SPARCstations costs \$175 for a single-user license and \$835 for a developer's kit. **■**

## Vendors divided on new access devices

*continued from page 9*

vices with the SNMP-compliant management consoles they use to manage other net elements, instead of purchasing a proprietary management system.

Amnet, Inc., a Framingham, Mass.-based packet switch vendor, and Netrix Corp., based in Herndon, Va., are considering developing integrated frame relay access systems.

Other data communications equipment vendors declined to divulge their product development plans. But the need for these new devices has stirred debate among these vendors.

While some see a requirement for systems that go beyond today's frame relay PADs and concentrators, others say current equipment fitted with frame relay software and interfaces will do.

"The installed base of equipment is easily adaptable to frame relay," said James Hahn, vice-president of technology investment at Gandalf Systems Corp. in Cherry Hill, N.J. "The installed base can be converted without changing" existing equipment.

Robert Machlin, Amnet's vice-president of marketing, disagreed. "If the [Intel Corp.] 8088 [microprocessor] was the end of the game [technologically], then retrofitting the old equipment is the way to go," he said.

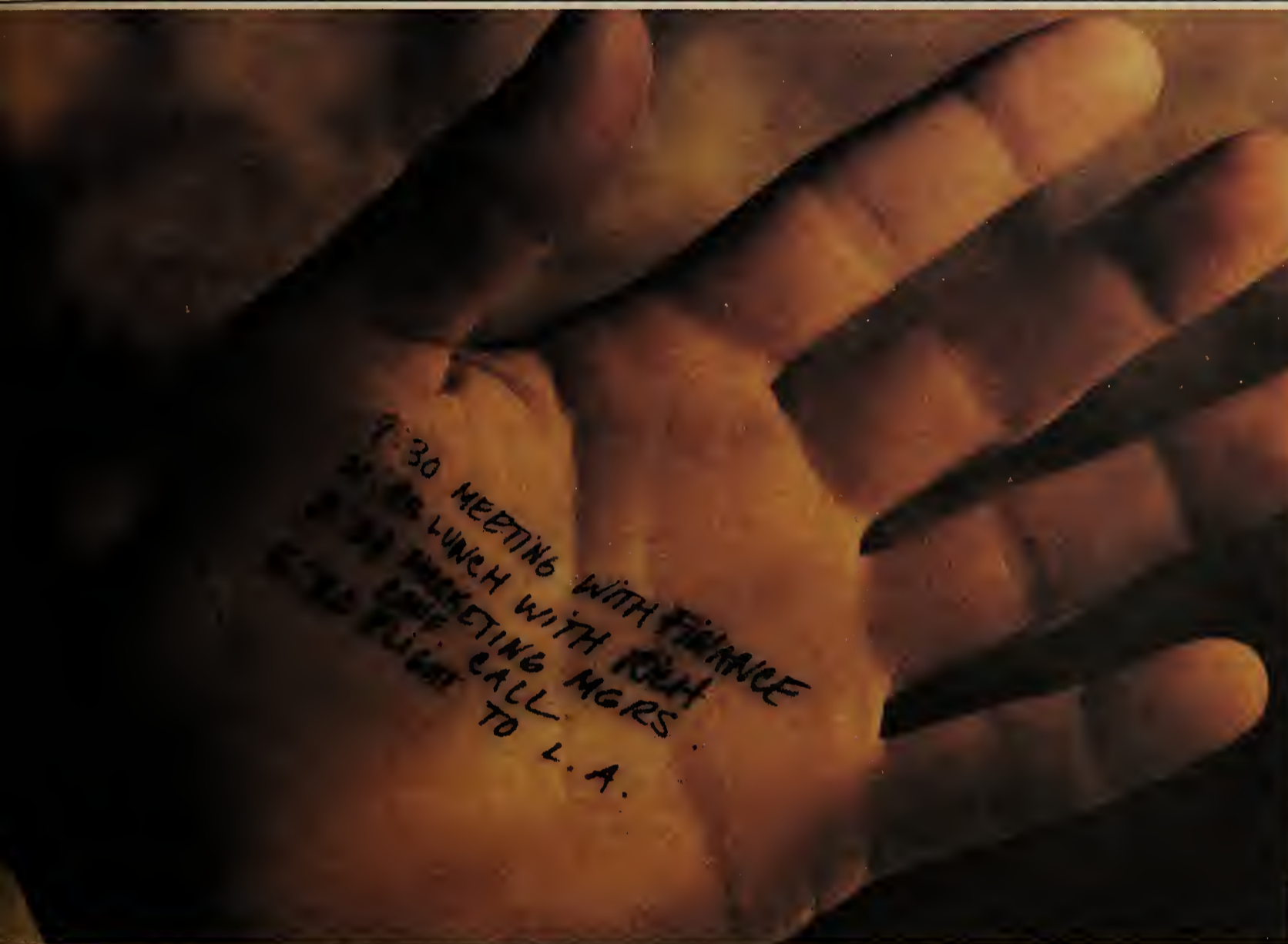
Others believe there is room for both existing and future generations of frame relay access devices as long as they accommodate the characteristics of the frame relay protocol.

"They all work as long as they are well designed and recognize that frame relay is not reliable," said Charlie Gallucci, product manager at Netrix. "There are not many [devices that do]. This is an area where you'll see a lot of activity in the future."

Not all users will need a new generation of access devices, said Paul Weekes, director of information technology management at Motorola, Inc. in Schaumburg, Ill.

"It's a situational case," Weekes said. "In some situations where you're integrating old technology and don't want to invest a lot of money, [current devices] make a lot of sense." Users looking to replace disparate access devices with a single box for LAN and terminal-to-host traffic are likely to purchase the next-generation systems.

Dan Ward, senior product manager at Racal-Datcom, Inc. in Sunrise, Fla., added, "There's going to be a lot of different methods used by a lot of different [users]." **■**



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## ISDN BASIC RATE INTERFACE

BY JIM LUX

# One user's journey into the lost continent of ISDN

Last summer, my company began investigating the possibility of replacing standard dial-up lines with Integrated Services Digital Network Basic Rate Interface (BRI) service. We concluded that ISDN is superficially attractive — in other words, beautiful only at first glance.

We run a distributed database system with about 100 personal computer users scattered throughout Los Angeles and adjacent counties. These users maintain a subset of a master database containing available industrial properties, which is similar to a Multiple Listing Service, maintained at a central site in Los Angeles.

The users spend from two to eight hours per week transferring data between their location and the central site using inexpensive 2,400 bit/sec modems. Planned enhancements that require the transfer of four or five times the current amount of data made it necessary to upgrade the modems to support 9.6k bit/sec V.32/V.42bis rates.

At first, BRI was an attractive alternative to that upgrade because the increased bandwidth would greatly reduce the

time required to transfer the data. With V.32 modems over standard dial-up lines, the transfer would still take from two to eight hours.

Our first major challenge in implementing BRI was finding someone at Pacific Bell, our local telephone company, that could provide definitive answers to important questions. Even a simple question about which local central offices support BRI (or when they will support it in the future) was met with some bewilderment.

Our second roadblock was BRI's limited availability — the so-called ISDN islands. I shudder to think how long it will be before ISDN calls can be exchanged between our two local carriers, Pacific Bell and GTE Telephone Co. We needed a solution we could implement immediately.

The system's users are members of a local industry organization, but they are separate and legal entities. These users do not have a lot of capital to invest in hardware; when we first looked at BRI, V.32 modems cost less than \$300. Pacific Bell said ISDN terminal adapters would cost about the same, so it looked like a reasonable option. However, we discovered that terminal adapters still cost more than \$1,000, about 4 times the price of a single V.32/V.42bis modem.

Our final problem was the incompatibility of the Northern Telecom, Inc. DMS-100 and the AT&T 5ESS switches used in our area. Each needs a different interface, but no one at Pacific Bell could tell us precisely what was required.

Based on our experiences, I would not recommend that users shift to BRI in the immediate future. After all, compare this hassle with the convenience of running to the local discount computer store and buying a V.32 modem: You can't get much simpler than a modular plug and a phone jack. ■

*Lux is co-owner of Innovation Consulting & Design, a consulting and software development firm based in Westlake Village, Calif.*

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## EDITORIAL

# PC-centric net plans pose challenge to NOS makers

Recently, Microsoft Corp. revealed its Windows Open Services Architecture (WOSA) and Apple Computer, Inc. announced its Virtually Integrated Technical Architecture Lifecycle (VITAL). Both define services that developers can support in building applications that can share information and access data across an enterprise net.

These grand plans could dramatically diminish the role of servers and network operating systems in personal computer networks. WOSA or VITAL will enable desktop devices to become less reliant on servers for exchanging messages, sharing files and accessing data on larger systems.

These PC-centric network plans promise to knock down

many of the obstacles to PC-to-anything networking.

The plans also reflect the market positions of proponents. Having failed to make real inroads in the network operating system market, Microsoft is now pitching its incredibly popular Windows as the ideal access point to services such as file and print sharing, database access and messaging.

Apple's VITAL is pegged on bolstering the role of Macintoshes in corporate nets.

But users have to wonder just how quickly and completely these visions will be realized.

Certainly, applications developers have a vested interest in supporting WOSA specifications — millions of Windows users are hard to ignore. But Microsoft

has not fleshed out those specifications, and it isn't clear when that will occur. Also, it is not clear when there will be a substantial number of applications built to WOSA or services that can be accessed via the architecture. Like Microsoft, Apple has to put meat on its VITAL skeleton and persuade developers to support the plan.

And the network operating system vendors aren't lying down. If early reports are accurate, Novell, Inc.'s NetWare 3.2 will provide a wealth of new services for desktop devices without the need for complex layers of software on each PC.

Ultimately, the PC-centric approach to networking is likely to dominate. But the '90s will be an interesting battleground. ■

# OPINIONS

## TELEMARKETING

BY MICHAEL FINNERAN

# Congress blunders in trying to manage telemarketers

A relatively new telemarketing law signed by President Bush last December to control telemarketers and other high-volume calling organizations is simply unworkable.

The law specifically aims to control telemarketers and other organizations that place unsolicited outbound calls or send junk facsimiles to telephone customers. However, there are already plans to exempt calls to persons with whom the caller has an established business relationship. That means your credit card company could still call you to sell luggage, for example.

Rather than consulting communications experts for proposals on how to control this nuisance, Congress has implemented a technical solution devised by lawyers and congressional aides.

Any plans to address this problem must consider callers' concerns. If telephone marketing is unduly hampered, marketers and other high-frequency callers will resort to other means, such as direct mail, for delivering their messages. The goal of such a bill should not be to hamper legitimate business from being conducted by phone, but to eliminate unwanted intrusions.

The basic problem with the bill is that it mandates classification of call recipients rather than callers. By the government's estimate, telemarketers operate about 300,000 outgoing lines. According to the North American Telecommunications Association, there are 135 million access lines in the U.S.

*Finneran is president of dBrn Associates, Inc., an independent consulting and market research company in Hewlett Neck, N.Y., which specializes in telecommunications and information systems.*

phone network, of which about 90 million are residential lines. From a numbers standpoint, it is a lot simpler to keep track of 300,000 callers than 90 million lines.

Assuming that half of the people using those 90 million lines do not want to hear from telemarketers, the congressional plan requires the establishment of a database with almost 50 million entries. That database will have to be updated ev-

**T**he bill mandates classification of call recipients rather than callers.

▲▲▲

ery time people move or change phone numbers — a formidable technical task by any measure. With the government operating this system, I am sure we can expect the same level of service we now receive from the U.S. Postal Service.

If we are going to get a handle on annoying calls, we should work from the receiving end of the call, not the originating end. A system based on classifying callers and using calling line identification (CLID) provides a more practical and effective solution.

Such a system would give call recipients the ability to determine which calls they want to receive and when they want to receive them. The first step toward controlling unwanted calls is to classify the callers and then assign telephone numbers with specific exchange codes for each class. Using CLID, call recipients can then block all calls from

each of those exchanges. This plan should be adopted in conjunction with a nationwide plan to roll out CLID.

One option would be to offer blanket blocking for all calls from specific exchanges. CLID would give prospective customers of companies that rely heavily on telemarketing a more precise way of screening their calls and one that would allow connection of calls that the user wants to receive.

With this arrangement, the customer would not have to answer the phone in order to get rid of an unwanted call. A button on the phone could allow the call recipient to reject the call without answering. In addition, the caller should still be charged for rejected calls.

A kinder and gentler option might be to allow callers to defer the call until they are willing to take it. An automatic callback feature or even a voice mail system might be used to reestablish calls to live operators or to interactive voice response systems. Basically, we should use technology to give call recipients the same options with junk calls that they have with junk mail.

We should encourage use of telecommunications services for marketing and other public communications activities.

Any policy that discourages the use of telecommunications technology — such as the recently passed telemarketing bill — while continuing to allow subsidization of junk mail, is simply off target. Junk calls and junk mail are both coming from the same groups, and a solution that substitutes one problem for the other is no solution at all.

Every effort should be made to replace paper with phone calls in public communications, and by using a CLID-based system, we can also clamp down on the nuisance of junk calls. **Z**

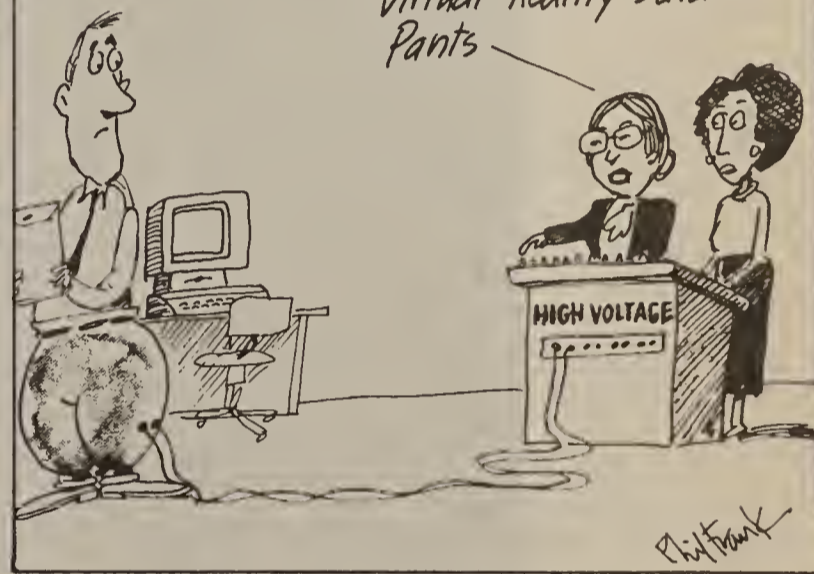
## TELETOONS

BY FRANK AND TROISE

The  
•Network Manager's Handbook•  
•RULE 36•

Use new technology strategically—  
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human productivity.

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motion, the Motivator  
will send a strong  
prompt to the worker's  
Virtual Reality Data  
Pants



## LETTERS

### Virus hoopla

Once again, we are being bombarded with an onslaught from radio, TV and print media about the computer viruses and worms that threaten to destroy our software.

I say all this is just a passing fancy — the exploitation of the week. Probably no one will care about virus threats even two weeks from now. Such threats have surfaced in the media before, and the perpetrators have gone essentially unpunished.

The virus threat should be addressed on a serious and continuing basis. From only six identified software viruses in 1982, there are now an estimated 1,000.

Every day, we depend more and more on computers, communications and information technology. Certainly, there are protective software programs that can test, analyze and temporarily eliminate viruses. A few antivirus programs were sold before the current media virus blitz, and

a few will probably be sold after the threat is perceived to be over.

Yet the threat that such products fight is constant and usually unpublicized. On ABC's Feb. 24 broadcast of "NightLine," Ted Koppel asked, "Why don't the computer manufacturers do something to prevent this threat?"

My answer: They generally don't because the market has not demanded it of them.

The public has not yet taken the dangers and ramifications of viruses and computer software seriously because it hasn't really understood the implications.

There are safeguards that  
(continued on page 43)

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Letters may be edited for space and clarity.

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### VIRTUAL PRIVATE NETWORKS

# The virtual business strategy

Virtual private net services appear alike, but examining the differences makes the strategic choice easier.

#### CONTINUED FROM PAGE 1

tive of the efforts required to set up and maintain these high-end services. Users are now forced to sign long-term contracts to lock in favorable prices.

When evaluating virtual net services, some of the critical comparative issues — such as network architecture, technological capabilities, network management and switched data support — lay under the surface of each carrier's offering. Others are rather standard, such as pricing, billing and domestic and international availability. (For a detailed comparison of virtual network services, see the chart on page 34.)

Each carrier's underlying intelligent network architecture will determine the strengths and weaknesses of its virtual net ser-

*Briere is president of TeleChoice, Inc., a Montclair, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (201) 746-0200.*

vice (see graphic, page 41). It's difficult to say that one or another of these architectures is better or worse than the others because that judgment depends on what users want from the network.

One of the most obvious components of an intelligent network is the switch used to process calls. The switch receives dialing information from callers and transmits queries to a database of virtual net customer information. The database returns instructions on how to process the call so the switch can route the call through the net.

Software in the switches and the computer databases dictates the level of sophistication and flexibility of virtual network features. Therefore, the relationship between the carrier and switch vendor is extremely important because the carrier relies on the switch maker to add features.

AT&T, of course, uses 114 of its own 4ESS switches in its Software-Defined Network (SDN). Sprint has 43 Northern Telecom, Inc. DMS-250 switches supporting domestic traffic on its Virtual Private Network (VPN) offering and three DMS-300 switches act-

ing as international gateways for its Global VPN service. MCI uses 29 DMS-250 and 41 Digital Switch Corp. (DSC) DEX-600 switches in its Virtual Network (Vnet) service. It also uses Ericsson AXE-10 switches as gateways to its international Virtual Network Connection service.

AT&T probably has the textbook example of an intelligent network architecture because it closely adheres to the standard intelligent network model. It uses databases residing on AT&T 3B20D minicomputers that are connected to switches via a single signaling protocol. The overall AT&T architecture could be deemed centralized or distributed. The carrier stores a particular customer's data on a centralized pair of 3B20Ds — one primary and one backup — rather than storing every customer's data on all its computers.

AT&T is the only carrier to have implemented the Transaction Capabilities Part (TCAP) protocol — a necessary ingredient for future international intel-

Here's a list of recent *Network World* articles on virtual private network services and related topics:

- "Virtual net providers mull cellular access questions," Feb. 3.
- "PacRim virtual net offerings scarce but sophisticated," Jan. 27.
- "European carriers move fast to offer IVPN services," Jan. 20.

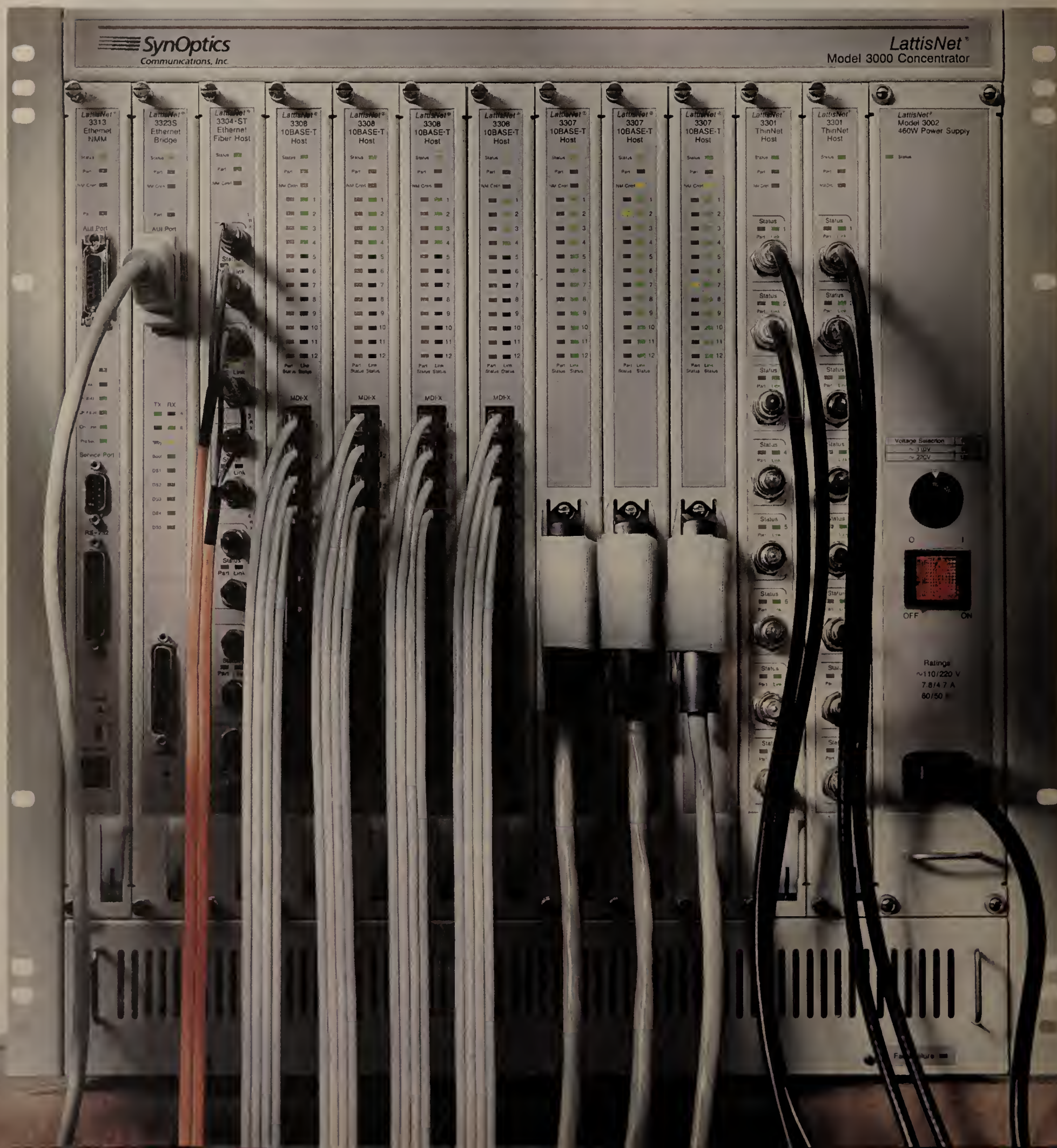
■ "AT&T offers protection against fraudulent SDN calling card use," Jan. 13.

■ "U.S. seeks common virtual net standard," Nov. 25, 1991.

■ "Beware of hidden variations in virtual network services," and "SS7: The talk of the town," Aug. 12, 1991.

■ "Carriers slowly improve management offerings," Feb. 4, 1991.

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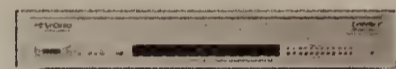


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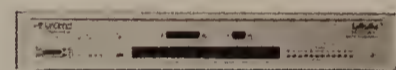


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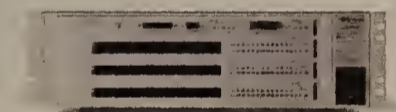
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# Evaluating virtual private network services

Criteria	AT&T	MCI Communications Corp.	Sprint Corp.
<b>Architecture.</b> How intelligent is the network? How is SS7 used? Is there look-ahead routing?	AT&T offers an intelligent network and distributes customer data among multiple SCPs. Signaling is ANSI- and CCITT SS7-compliant at the basic protocol levels. AT&T is the only carrier using SS7's Transaction Capabilities Part protocol. Network has look-ahead routing.	MCI uses intelligent network structure and stores all customer data on each SCP. It only uses SS7 for call setup. X.25 is used to transmit messages between switches and SCPs. Signaling is ANSI-compliant. No look-ahead routing.	Sprint uses a decentralized database structure, storing customer data on switches. It uses ANSI-based SS7 for call setup. No look-ahead routing. Sprint is planning move to a SCP-based architecture.
<b>Access.</b> How broad are access and egress options? Are separate equal access codes used? How is ISDN implemented as an access mechanism? Are there any unique access capabilities?	AT&T continues to be dogged by switched access provisioning, although it is getting better. This and other problems are caused by the need to use a 10732 access code that is separate from the one used to access other AT&T long distance services. AT&T has a wealth of network remote access features including the SDN Card, a credit card used to bill calls made from off-net sites to an SDN account using 0+ or 800 dialing. However, access to certain SDN features is available from 0+ only dialing while access to others is limited to 800 numbers. AT&T's implementation of ISDN access is broader than any carrier. AT&T's cellular access support is far inferior to the competition's, but it could quickly turn into the leader with planned changes this year.	MCI has a slightly higher level of access capability than AT&T or Sprint. MCI uses a single 10222 access code for Vnet and other long-distance services. It also has fully integrated its Vnet Card into its Vnet offering, meaning users of the card can access all Vnet features. MCI has offered ISDN access for a shorter time than AT&T but has installed a large number of PRIs. MCI is the only carrier to formally offer international private-line access via MCI InterLink. Other carriers offer this capability on request. MCI supports cellular access nationwide for worldwide calling.	For most access options, Sprint is on par with the other carriers. Sprint uses a single 10333 access code for its VPN and other long-distance services. Sprint offers ISDN access nationwide but backhauls ISDN traffic to 2 switches because it has fewer ISDN-compatible switches. But the affect on users may be negligible if switch diversity and capacity are not issues. Sprint's VPN-FON-CARD can be used for on-net calling as well as other feature-driven applications. Sprint supports cellular access nationwide for worldwide calling.
<b>Features.</b> What is the range of features available to users? How sophisticated are they functionally? How well do they work with one another? What unique features are offered?	Based on tariffed technical capability, AT&T has the deepest set of features that enable customers to build the broadest range of applications. However, some features are very confusing to unsophisticated users since they were designed to support advanced customer applications. <i>To obtain some functionality, users must subscribe to multiple features.</i>	MCI closely follows AT&T, matching its competitor in most instances. But the features used in certain applications are not as flexible as AT&T's. But for the vast majority of applications, MCI's features are as good — and far less expensive — than AT&T's. MCI Offers Point-of-Origin Routing, something that AT&T does not.	Like MCI, Sprint's tariffed feature capabilities are on par with AT&T for most applications. Sprint claims it customizes many applications to meet user needs. However, the success of this customization is hard to gauge. Sprint is developing some features such as speed-dial numbers, which other carriers do not have.
<b>Switched Data.</b> What services are available? Do they require ISDN? To what degree are international standards supported? Are they available internationally?	AT&T took the early lead in switched data and has since kept it. Because it is the leader in ISDN implementation, AT&T is the only carrier with CCITT H0 and H11 offerings. It is also the only carrier with substantial international switched data offerings.	MCI offers a broad range of switched data capabilities, including switched 56K/64K services. It spreads data across multiple 56K/64K bit/sec (Nx56K/64K bit/sec) circuits to attain greater speeds. MCI has no international capabilities, <i>however. That should come by the year and MCI should also have H0- and H11-based offerings within 18 months.</i>	Sprint offers a switched 56K/64K bit/sec capability and uses Nx56/64K bit/sec to attain higher speeds. Sprint reportedly is working on H0- and H11-based services. Sprint has the only multilateral switched data offering among the 6 GLOBAL FON countries. <i>But bilateral international switched data service is lacking.</i>
<b>International.</b> Where is service available? To what degree has the carrier offered a formulated international strategy? What are the present interactions with leading virtual network standardization movements and alliances? What sort of international package does the carrier offer?	Despite all the early chest beating of other carriers, AT&T has gained the lead in international virtual networks, even though it lacks a multilateral offering. AT&T operates bilateral service with over a dozen carriers worldwide, with customers signed up with each. AT&T is leading the global movement to worldwide standardization of signaling systems and service descriptions for virtual network service. AT&T has international switched data and related service such as private-line and 800 offerings, which give it an advantage.	Of the three carriers, MCI seems to have the least clear international virtual network strategy. Where Sprint has its GLOBAL FON alliance and AT&T is leading the GVNS Forum, MCI appears to be following more than trying to forge ahead on its own. Still, MCI has a considerable number of operational bilateral offerings in place and expects to add more this year. Overall, MCI lacks a strong advertised international strategy in virtual network services, despite leadership in private lines and other international services.	Sprint was the early leader global virtual networks. It formed the GLOBAL FON alliance, comprised of seven carriers in many major countries of the world. The jointly offered service is called Global VPN. It has the only viable multilateral offering, with 7 partners committed to service in 6 countries, although only 4 carriers have service up and running now. The remaining 3 are expected to have service available this year. Sprint is still without multilateral offerings in some major markets, notably Japan. Sprint's bilateral offerings are far less AT&T's and MCI's. Sprint needs a strong implementation schedule this year to regain leadership.
<b>Billing.</b> What is the range of invoice and management reporting capabilities? Which carrier systems are involved? How can customers receive their bills? What unique and innovative ways are the carriers setting trends in the marketplace? How accurate is the billing? What is coming down the road?	AT&T has the broadest coverage of invoice and management reporting information. Its Execu-Bill reports set the pace for calling card reporting. AT&T has made great headway in the past year on SDN billing. Bill mail-out has improved substantially, and errors are down. But AT&T suffers from having too many systems feeding the SDN machine. Reports are inconsistent and varied in their <i>coverage of important information. AT&amp;T is spending a lot of money this year to rectify this situation, but with so many systems, it will take awhile to bring all its different capabilities to the same level.</i>	MCI offers the most consistent, accurate and presentable bills in the industry. While it does not meet the depth of some of AT&T's reporting, MCI's bills are far more easy to read and digest than the standard AT&T bill. MCI has avoided many of the billing problems that have affected AT&T and Sprint customers. MCI offers Portfolio, the only true consolidated reporting system on the market. It is also the leader in <i>alternative bill delivery and is beta testing delivery of bills via E-mail, EDI and on CDROM.</i>	Sprint's high-end reporting system needs of a major overhaul. Its standard reports are considerably more basic than those of MCI and AT&T. But Sprint claims it is more open than those 2 carriers to provide customized billing as opposed to a large menu of standardized reports. However, some billing errors are still making it to customer desks. Sprint is now enhancing its billing capabilities for high-end customers after rolling out its new IPS offering to low and mid-range customers in 1991. Development of a new National Accounts Billing system is answering customer <i>requests for more detailed information and Sprint is expected to migrate the first VPN users to IPS later this year. In the end, both systems will be used to support VPN.</i>
<b>Network Management.</b> What element, cross-service and cross-vendor management options are available? What is the relationship of the features and options of the services and management provided? What is the speed on which these network changes are acted?	AT&T has one of the world's leading network management systems and sets the pace for controlling virtual net services. The carrier has multiple element systems that can be consolidated under its Accumaster Services Workstation or Accumaster Integrator products. AT&T is sending <i>out bills and other usage information via its network management systems. Many of AT&amp;T's systems make network changes in 5 minutes, which is considered near real time.</i>	MCI also has a respectable virtual network management system, which is available in elements or as part of its Integrated Network Management System and enables users to change most feature configurations within 5 minutes. MCI's net management systems are newer than AT&T's. Its FocusNet multivendor product is still in its initial stages. In the area of virtual network configuration management, MCI's offering arguably exceeds AT&T's. But in the other element management systems, AT&T holds an advantage.	Sprint is just now getting serious about network management. It recently launched its Insite Executive (called Insite II internally) offering. But until its VPN goes to an SCP-based architecture, the full power of Insite Executive for managing VPN will not be <i>realized. In the meantime, VPN customers will use Sprint's Insite PC offering, which offers authorization and class of service maintenance as its major capabilities. Don't expect Insite Executive to fully manage VPN until later next year.</i>
<b>Pricing.</b> How expensive are the services? What are the optional costs? How elegant, complex or confusing is the pricing? What's the bottom line likely to look like?	Where AT&T really falls down on the job is in pricing. AT&T markets SDN as a premium service and charges a lot for it. While in most cases usage pricing is competitive — now typically within 5% of competitor offerings — the feature and other fees are excessive. AT&T does not adhere to the MCI and Sprint concepts of offering switched data at the price of voice, charging, in some cases, 10% to 15% more for data than voice. AT&T has a variety of confusing term plans and discount options. But expect AT&T to be the more expensive carrier in almost all cases. And AT&T is raising its rates. MCI and Sprint will lag behind AT&T in raising virtual network usage fees.	MCI charges the same for all calls, regardless if they are voice, data, image or video. Its pricing is the most in tune with future user requirements. MCI is already charging on a per-element basis in anticipation of enabling users to build specific applications. As virtual network services include more elements, MCI's approach of breaking usage into access, transport and egress fees, for example, will better handle custom applications. Features are less expensive than AT&T's but not as inexpensive as Sprint's. MCI has several term and volume discount plans. It raised rates <i>substantially last year to close the gap between its rates and AT&amp;T's, but its average network is still priced lower.</i>	Depending on the network configuration and number of usage hours of per month usage, Sprint is usually the low-cost provider. It waives charges on nearly all its features, too. Sprint's retail pricing plans including volume discounts and term plans are not nearly as complex as those of AT&T and MCI, leaving room for customers to negotiate pricing. Sprint pioneered the concept of data at the price of voice and has remained faithful to that idea. Expect Sprint to remain competitive on pricing. Like MCI, Sprint will follow AT&T's rate increases but with a slight lag.
<b>Totals.</b> What is the bottom line? Which carrier is the best? What's the philosophy of the carrier? Where is each carrier headed? What are the strengths and weaknesses of each carrier?	AT&T offers the most functionality on the market today but expect to pay for it. While this functionality may enable AT&T to create new applications that generate new revenue or decrease costs, it is expensive for the average user. That will be the biggest nut for decision makers to swallow. AT&T's billing problems and faltered network reliability cast a shadow over SDN, but AT&T development teams are addressing those issues. AT&T's philosophy is to be ahead of the marketplace, attempting to plan in advance for changes coming down the road. The SDN user group pushes much of this development. AT&T's biggest <i>task will be to start consolidating and integrating the numerous elements that comprise SDN into a more concise and consistent product. Overall, expect AT&amp;T to remain the leader in the near term.</i>	MCI offers the end user a choice middle ground between AT&T and Sprint. It offers the feature requirements for nearly all applications at a reasonable price. MCI is weak in international switched data, something it expects to rectify this year. The carrier is also working to expand the depth of feature capability available to customers. MCI's philosophy seems to be to stay in tune with the market, which it does at a price that is acceptable, given the alternatives. In the end, MCI offers the most consistent product of the 3 carriers when all key factors have been considered.	Sprint offers something for everyone, often through customized, not tariffed, offerings. Users should look beyond Sprint's tariffed offering when comparing services because the carrier is more likely to accommodate unique customer requirements. What is not available in feature functionality, Sprint makes up for in price. The carrier is still lacking when it comes to standardized billing and has no broad-based, customer-controlled network management to speak of. Sprint emphasizes its willingness to customize both billing/reporting and network management systems but is placing a new effort on customer service and <i>infrastructure where it has not done so before. Technical foundations for new billing, net management and network architectures are being built.</i>

H0 = CCITT standard for 384K bit/sec transmission  
H11 = CCITT standard for 1.5M bit/sec transmission  
IPS = Invoice Processing System

PRI = Primary Rate Interface  
SCP = Service Control Point  
SS7 = Signaling System 7

SSP = Service Signaling Point  
Vnet = MCI's Virtual Network  
VPN = Sprint's Virtual Private Network

This information is based on a broad spectrum of capabilities. Each carrier offers a different depth of virtual network service. Customers with rather basic needs will find more equivalency in the carrier offerings. Customers with more advanced applications will find this information more in tune with their requirements.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

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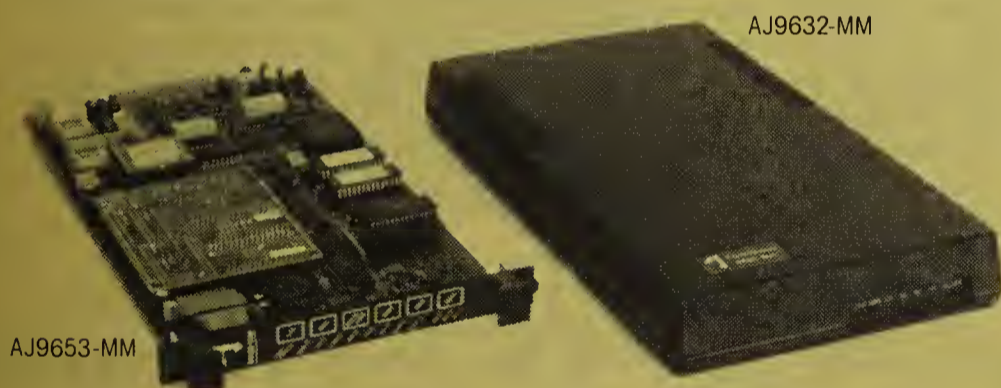
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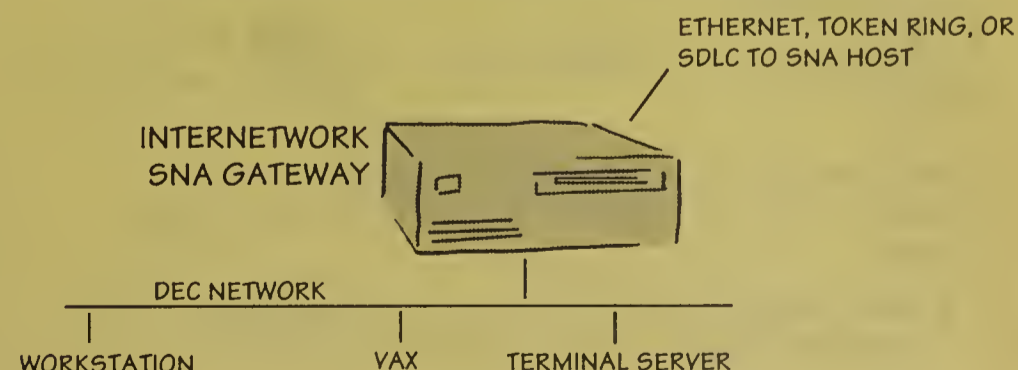
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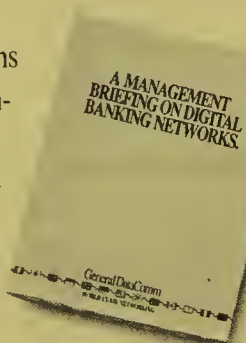
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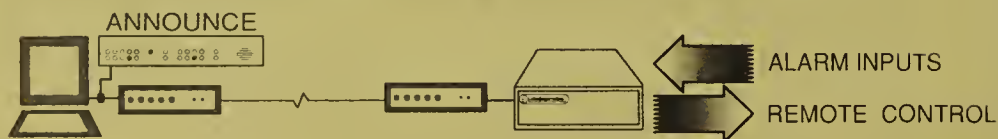
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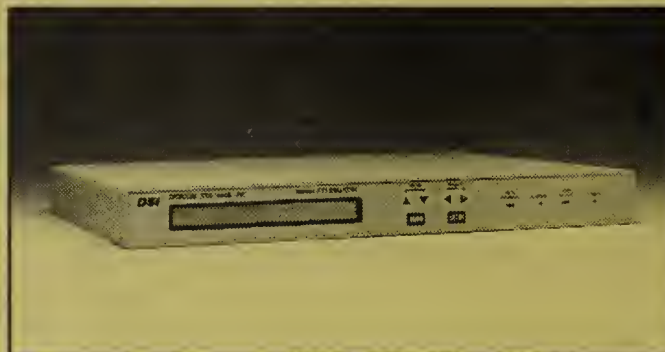
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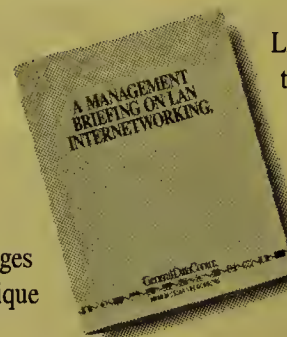
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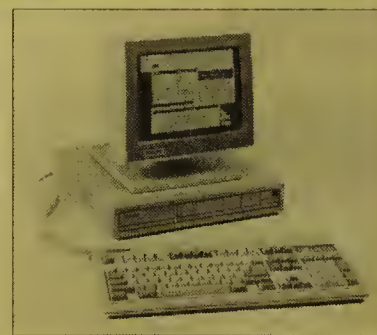
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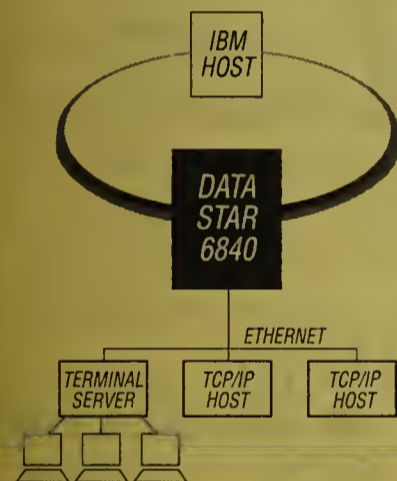
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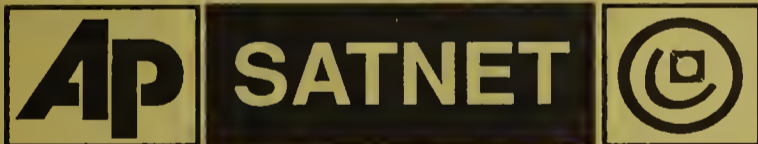
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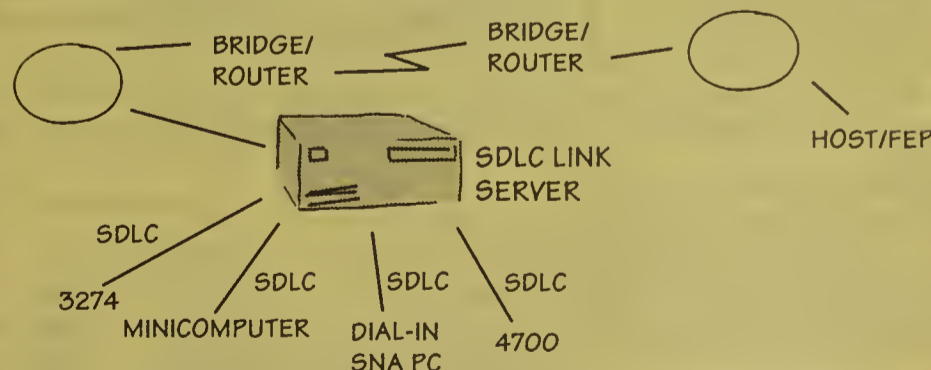
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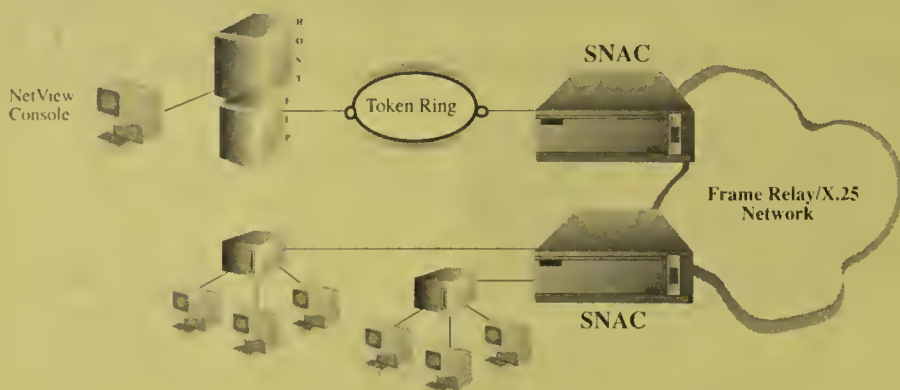
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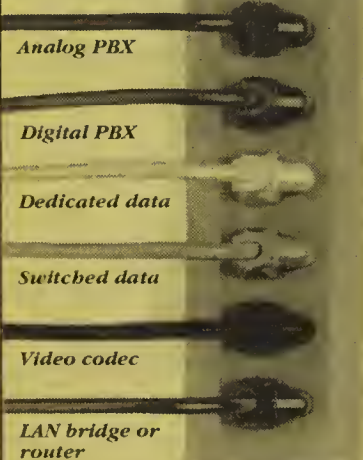
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By Paul Longoria

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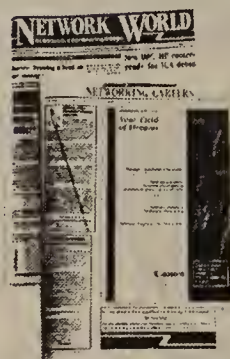
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☐ URGENT

1. Action requested

- 1 ☐ Request for sales call  
2 ☐ Request for proposal  
3 ☐ Request for information

2. Purchase timeframe

- 4 ☐ Within 60 days  
5 ☐ Within six months  
6 ☐ Within one year

3. Scope of purchase responsibility

- 7 ☐ Enterprise wide  
8 ☐ Departmental

4. Purchase influence/number of sites

- 9 ☐ One site 11 ☐ 10-20 sites  
10 ☐ 2-9 sites 12 ☐ 21+ sites

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140	141	142	143	144	145
146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175

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161	162	163	164	165	166	167	168	169	170	171	172	173	174	175

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(continued from page 31)  
 ligent network services — in its Signaling System 7 (SS7) (see "What's all this about TCAP?" page 42).

AT&T SDN product managers work with AT&T Network Systems managers to promote and prioritize development of features for AT&T switches used in the U.S. and abroad. In fact, the carrier is expected to implement software changes that will allow AT&T 5ESS switches sold abroad to internetwork with 4ESS switches used in the U.S. This will

Just as AT&T is overcoming problems with its databases, it must shore up its faltering long-distance network. After suffering three major crashes during the last 18 months, AT&T is launching a flurry of features designed to improve reliability. The problem, however, is that AT&T will likely charge users extra for those features.

AT&T's new Split Access Flexible Egress Routing feature, for example, allows SDN sites to obtain service from two AT&T points of presence (POP) for redundancy. One site can take over all processing if the other fails. This service costs \$2,500 to install and \$50 per month per T-1 line to the primary POP, with no cost for the feature at the secondary POP. MCI and Sprint say their virtual nets will provide similar functionality at little or no cost.

Another weak point for SDN is that AT&T is still dogged more than other carriers by delays in installing switched access to its virtual network. While bringing switched access sites on-line to SDN takes about 25 days at best, adding SDN features to those sites can delay installation as long as 45 days.

#### MCI architecture issues

MCI's long-distance network seems to be spared many of AT&T's size-related problems. MCI stores all customer data on each of three Digital Equipment Corp. VAX Clusters. Query misrouting has never been a problem for MCI, and although the carrier experienced minor net crashes in the past year, none affected its service as broadly as the outages that plagued AT&T.

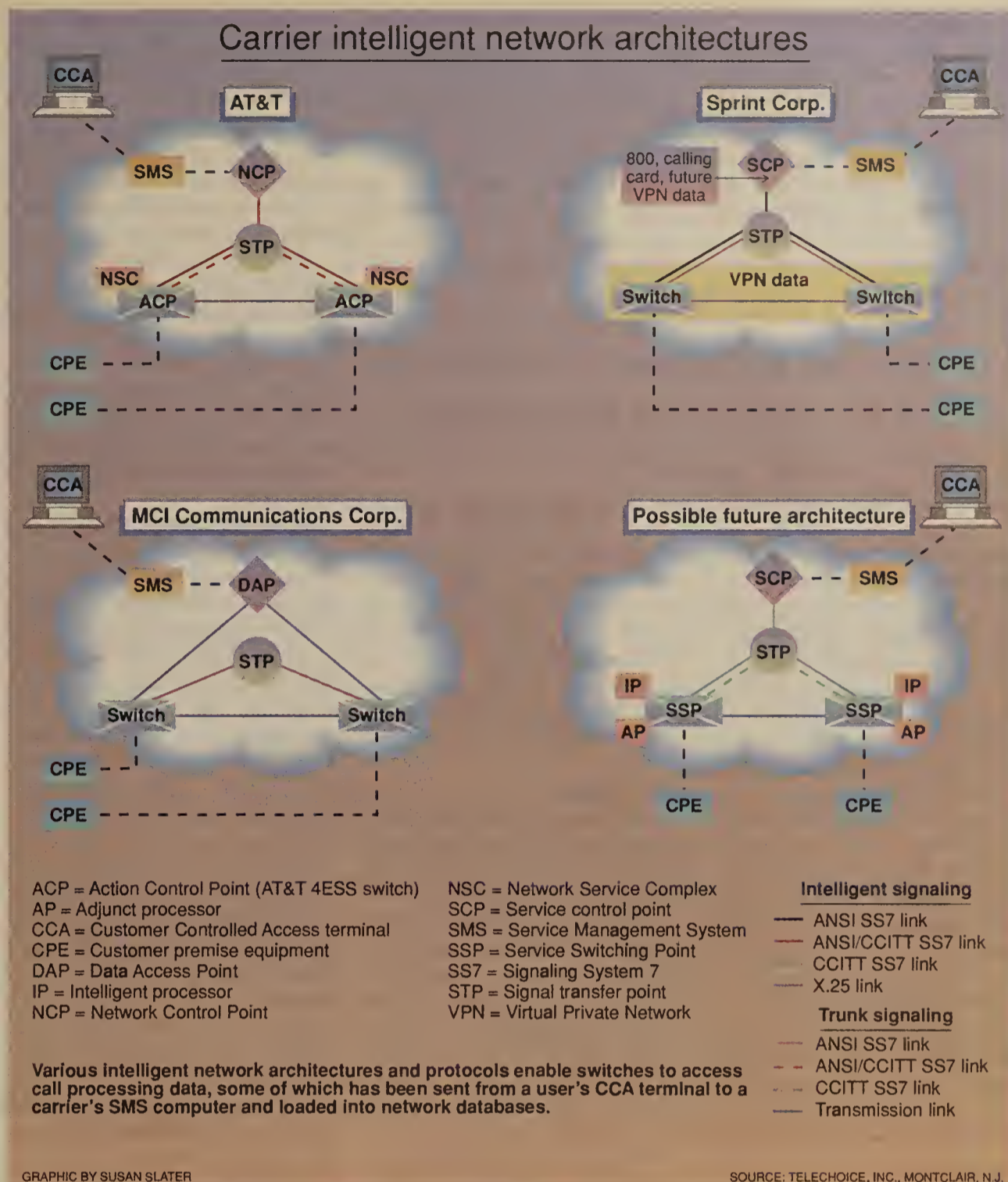
MCI also uses two switch vendors — Northern Telecom and DSC. This strategy has its pros and cons. On the plus side, MCI can exploit the development schedules of both switch vendors, implementing enhanced functionality as soon as one of the two vendors offers it.

If one switch maker provides an advanced feature sooner than the other, MCI may offer that feature to certain customers that request it. This policy requires traffic from that customer to be backhauled through MCI's network to the nearest compatible switch, which has proven to be costly. Alternatively, MCI waits until both switch vendors offer the same advanced feature and then provides it to all Vnet customers simultaneously.

On the down side, MCI does not have the same control over switch development that AT&T does because it does not own Northern Telecom or DSC.

#### Inside Sprint's network

In an attempt to gain an advantage over MCI and AT&T,



Sprint is moving to update its long-distance network architecture. Since 1985 or thereabouts, VPN was the first virtual network service on the market and is based on distributed intelligence, where customer data is stored in each switch.

Storing customer data on switches allowed Sprint to get into the market quickly, but it limited the carrier's ability to implement sophisticated applications that require the quick updating that is available with centralized databases.

Sprint is expected to move VPN to a centralized architecture as part of its broad long-distance network upgrade. While the upgrade is scheduled for completion in the next year or so, it's not clear when VPN will actually utilize the centralized architecture.

Today, Sprint uses SS7 for call setup throughout its network, and like AT&T, Sprint is tied to a single switch vendor — Northern Telecom.

Neither Sprint nor MCI has implemented look-ahead routing in their networks. MCI is expected to offer the feature next year. Sprint will also offer the feature but would not say when.

As the virtual net services of

the Big Three encompass more functionality under their umbrellas, users will find them moving the centralized architecture paradigm toward a hybrid centralized/distributed architecture in which certain functionality is provided by intelligent processors and adjunct processors collocated at virtual network POPs.

If a customer buys network-based voice mail, it doesn't make sense to store all messages in a centralized facility and tie up

accommodate new technologies. For instance, as conducting business becomes more mobile, the Big Three will find it necessary to provide access to virtual nets from cellular telephone and personal communications networks.

AT&T recently filed for its first cellular access to SDN, but widespread availability has been delayed while regional Bell holding companies make necessary arrangements to accommodate SDN's special 10732 access code.

## A big problem in accommodating cellular access is roaming.

trunks each time a person wants to check a mailbox. Instead, those messages could be stored either in an intelligent processor at the POP nearest the customer or at the customer site, thus tying up only local-loop lines or inside wiring.

Carriers must also change their virtual net architectures to

Whereas MCI and Sprint have offered cellular access across all RBHC territories for years, AT&T's initial offering only covers Bell Atlantic Corp.'s and Nynex Corp.'s areas.

A big problem in accommodating cellular access is roaming — when users leave their local call-

(continued on page 42)

(continued from page 41)  
ing areas and place calls on other cellular systems ("Virtual net providers mull cellular access questions," NW, Feb. 3). Currently, limited capability exists to identify the cellular system in which the end user roams or to

their switched data service to access AT&T's. MCI and Sprint effectively absorb these costs.

However, it's important to note that circuit-switched data is not the only data game in town. AT&T, MCI and Sprint all have frame relay offerings and will

## It's important to note that circuit-switched data is not the only data game in town.



which carrier the customer is pre-subscribed, much less the particular carrier service the customer uses. Lacking those abilities, the interexchange carrier cannot assign particular features or billing functionality to roaming callers.

Within the next two years, changes to local carrier and cellular networks are expected to allow carriers to incorporate roaming cellular users into virtual networks. Despite its slow start, AT&T is likely to be one of the more aggressive players in this area.

### Virtual switched data

Just as carriers are working to add wireless access to virtual networks, they are appending

likely make frame relay available soon under the virtual net umbrella. Users will also find carriers willing to offer emerging data services, such as Switched Multi-megabit Data Service and Asynchronous Transfer Mode, under virtual network services.

### Manage this

Net management capabilities are another key virtual network feature any midsize or large user can employ to judge services.

Currently, users can connect a customer premises-based personal computer or network management system terminal to the element management systems carriers utilize to govern virtual net services ("Carriers slowly improve management offerings," NW, Feb. 4, 1991).

Both AT&T and MCI have advanced packages that can manage and monitor virtual network features and functionality. Sprint launched its Insite Executive platform in January, but it cannot be used to fully manage VPN until Sprint converts VPN to a service control point (SCP)-based architecture. It does not make sense for Sprint to expand Insite PC, which is currently used to manage VPN, when it will move to an SCP-based architecture by 1993.

In the long run this may not be enough. Each carrier is working to develop advanced workstation-based service creation environments (SCE) that will allow users to develop service mixes that specifically address their needs. SCEs will use object-oriented programming systems that enable the operator to piece together new services based on pre-programmed modules.

The degree to which carriers provide SCEs to customers will vary. All major switch vendors sell SCEs with their switches, so carriers now have access to the services, and users will find increasing access to SCEs over the next two to three years.

### Over there

Users with international calling requirements will also find

that each carrier has something different to offer. There is a lot of argument as to which of the Big Three is leading the race to extend virtual net services beyond the U.S. However, one thing is certain: The market is not nearly as far along as each of the carriers would like users to believe.

For example, while virtual network service is available in most major countries in Europe, some carriers there are still either in the beta-test stages or bringing their first customers on-line. As a result, the back office-related procedures, including billing and customer support, are still being ironed out.

Sprint was the first carrier to offer full-featured international virtual network services when it introduced Global VPN in 1990. Global VPN was developed as part of Sprint's GLOBAL FON alliance with six other carriers, including Australian and Overseas Telecommunications Corp., Hong Kong Telecom International, Ltd., Mercury Communications, Ltd., PTT Telecom Netherlands, Teleglobe Canada, Inc. and Unitel Communications, Inc.

Global VPN promises multilateral, coordinated service among the seven carriers. A common thread among GLOBAL FON members is that they all use Northern Telecom switches, which utilize a proprietary SS7 protocol. Last month, GLOBAL FON alliance members met to discuss such items as joint product development (not just coordinated development as it has been in the past) and a new centralized

customer service center concept.

Initially, the alliance was criticized for being all talk and no action. Of the seven GLOBAL FON members, four — Hong Kong Telecom, Mercury, Sprint and Teleglobe Canada — have commercially available service. However, momentum is increasing as users such as DEC, Grand Metropolitan PLC and Rockwell International Corp. have signed up for Global VPN. The remaining four GLOBAL FON members expect to provide service by the end of October. Moreover, Sprint projects that two more European carriers and one Asian carrier will join GLOBAL FON by year end.

Where Sprint does not have multilateral Global VPN service, it has been pursuing bilateral service agreements with overseas carriers, similar to AT&T's and MCI's strategies. However, Sprint

other carriers, and MCI has agreements with 10 (see graphic, page 43).

While Sprint is interconnecting its services with overseas carriers that also use Northern Telecom switches, AT&T and MCI are attempting to establish standard links between the switches they use and the disparate switches used by overseas carriers.

Since last year, AT&T has been involved in an initiative among 32 worldwide carriers to standardize virtual network features and signaling, effectively matching the Sprint multilateral offering. However, it is likely to take at least a year to agree on the base-level standards.

The determining factor in the development of international virtual nets will be how critical it is to spread domestic applications internationally. The features

## Global VPN promises multilateral, coordinated service among the carriers.



leads the way in promising connections and claims it will have bilateral service to 23 countries by year end.

Despite Sprint's efforts, it has agreements to offer international virtual network service with only four other carriers. AT&T currently has agreements with 13

each carrier offers for supporting those applications will dictate potential options.

For example, MCI currently does not offer international switched 56K/64K bit/sec service, but AT&T and Sprint do. MCI's international data capability is due later this year.

## What's all this about TCAP?

Users investigating virtual network services will soon be hearing a lot about the Transaction Capabilities Part (TCAP), a protocol used in Signaling System 7 (SS7). TCAP provides more efficient communications between carrier switches and databases ("SS7: The talk of the town," NW, Aug. 12, 1991). Specifically, it allows carriers to send and request more information from their databases, enabling them to implement more advanced applications.

TCAP is expected to play an important role in global virtual net applications, such as 24-hour help desks and international telemarketing. For example, TCAP could allow AT&T's Software-Defined Network databases to query databases used in France Telecom's Colisee virtual network service for appropriate number translation and call routing instructions.

Without standardized TCAP interfaces, carriers must imple-

ment bilateral proprietary connections between carriers in different countries and their services. MCI Communications Corp. recently struck such an agreement to establish an X.25 link with British Telecommunications PLC for calling card validation.

### Precocious protocol

However, some TCAP critics say the protocol is ahead of its time because it's not useful internationally and will not be required for at least a year. Despite such criticism, MCI is moving to install TCAP domestically in 1993 to replace X.25 messaging between its switches and centralized databases. This project will enable MCI to carry more information across its domestic long-distance network and communicate with TCAP-compatible local carrier switches. But since overseas carriers have few TCAP-compatible switches, MCI is in no hurry to

implement TCAP internationally.

AT&T already has a form of CCITT's TCAP in use domestically and is working with other carriers worldwide to perfect TCAP-based messaging. Currently, Sprint Corp. only uses the lower levels of SS7 for processing calls. Since TCAP is a higher level protocol, it is not in use yet.

As end users request more virtual network applications, the use of TCAP in carrier networks will become a strong purchase factor. Once implemented in carrier networks, users may start requesting TCAP links between customer premises equipment and carrier switches. This will enable users to craft truly advanced virtual network applications.

AT&T has already released a specification detailing how users can establish SS7 links from customer premises equipment and its network.

— Daniel Briere

switched data capabilities to existing voice services.

The carriers deal with data in substantially different ways. MCI and Sprint rely on multiple switched 56K/64K bit/sec circuits to provide transmission speeds up to T-1, often called Nx56/64K bit/sec service. AT&T offers individual switched 56K/64K bit/sec circuits, too, but also provides switched 384K and 1.536M bit/sec circuits that comply with the CCITT H0 and H11 standards, respectively.

The way switched data calls are priced is an important factor in this area. AT&T assesses surcharges for data calls, while MCI and Sprint price each 56K/64K bit/sec switched data circuit the same as a voice call. In addition, AT&T passes on any surcharge that local carriers assess for using

The quest for global network management has been heating up as users start juggling the maintenance of multiple virtual network services in foreign countries. For now, this means maintaining different dialing plans and feature sets — one for each carrier. Unfortunately, there is not much substantive improvement on the horizon. Lacking international standards for the underlying services, the carriers cannot even start to approach the concept of centralizing or interconnecting network management systems globally.

### Price, price and price

Despite the increasing emphasis on strategic relationships among carriers,

customized development. An increasing number of custom contract negotiations are turning into back office negotiations, with items such as billing, custom application development and on-site carrier personnel having cost implications.

As users continue to turn over basic telecommunications tasks to carriers as part of these service agreements, they are able to cut in-house expenses, effectively lowering the overall cost of doing business with one particular carrier over another.

### Billing battlefield

While pricing strategies can tip a user in favor of one carrier, the way carriers bill for virtual nets could be the deciding factor. Carriers are consolidating billing across product lines.

MCI offers the best reporting for virtual net services. It has the most consistent billing product in the industry, both in accuracy and appearance, and sports the only currently available consolidated reporting product, Portfolio. MCI charges a \$250 installation fee and \$100 a month for Portfolio, plus \$50 to \$100 for extra reports.

AT&T will be making major changes to its SDN Biller product this year, combining SDN billing development with that of its private-line services to simplify and streamline billing for SDN customers.

AT&T has worked hard to resolve billing problems with the high end of the marketplace, but it has a long way to go. SDN customers still complain of errors in bills, although complaints have lessened considerably during the last two years. AT&T sets the pace with certain reporting — Execu-Bill, for instance, provides the best calling card reporting available.

Sprint is also making great strides in the billing arena. When Sprint embarked on plans to move VPN to its new Invoice Processing System (IPS) in early 1990, it froze expenditures to customize and update the current National Accounts Division billing system — the present VPN Biller product. With its decision last year not to migrate VPN to IPS, Sprint is working to add new functionality to VPN Biller over the next 12 to 24 months.

### Brownie points

In addition to improving their regular lineup of virtual network features, each of the Big Three carriers is working on unique offerings that may win them a few Brownie points with some users.

For example, Sprint has reworked the underlying technology of its Voice FONCard, a variant of its VPN calling card, and currently has the product in beta test. Voice FONCard allows users to deploy specific spoken words to initiate network actions, such as dialing.

MCI has targeted billing as one of its differentiating areas. It is currently the only carrier beta-testing delivery of bulk billing data using CDROM. MCI is also beta-testing transmission of billing data via MCI Mail, which has some degree of error checking of files. AT&T and Sprint, on the other hand, deliver call data on multiple disks.

The benefit of using CDROM is that it is an ideal storage media — better than magnetic technology, which can erase data over time. This is critical for users that constantly access archived data. MCI's billing software product, Perspective, which can access this CDROM data, won the New

Product Achievement Award at ComNet in Washington, D.C. this past January.

One of the areas in which AT&T has jumped into the lead is real-time monitoring of some network costs. Late last year, AT&T released its SDN Card Guarantee to cover customer liability in cases of internal fraud, in which employees use the card for noncompany calls and rack up huge bills ("AT&T offers protection against fraudulent SDN calling card use," *NW*, Jan. 13). The user is liable for all of these costs, unlike external fraud, such as hacking, which is covered by credit card liability limits. The SDN Card Guarantee allows the end user to set usage limitations for SDN Cards, thereby limiting the corporate exposure to internal fraud.

The key to this feature is not only the limitation itself, but how reaching the limit is calculated. AT&T prices each call on a per-minute basis in real time using rate information that includes any applicable discounts. The implications for the future are broad. Combining such real-time capabilities with screening features, users could substantially increase their monitoring and control of calling costs in a near real-time fashion.

When all factors are considered, AT&T will continue to be the safest bet for virtual network services. Its strength in architec-

ture, network management and international services cannot be ignored.

However, MCI claims advantages in other equally critical areas, such as billing and pricing.

Sprint has shown its willingness to customize its product in order to meet specific needs, making it difficult to gauge Sprint's exact strengths and weaknesses on a generic level. Moreover, Sprint's new resolve to cut back on preannouncements has hidden much of its efforts to enhance VPN.

In the end, buying a virtual network service is indeed a company-specific task because such services are often customized to meet particular requirements. While many of the features and capabilities are generic, how they are put together and packaged to act as a single network will vary from user to user.

Managers should exhaustively check all details of a virtual network service to weed out a lot of the misinformation currently in the marketplace. User groups, conferences and seminars are great places to double-check information.

Above all, realize that your company will likely be stuck with the virtual network service it chooses for at least three to five years. So it's important to make sure this strategic purchase decision is a wise one. **Z**

Operational, bilateral, international virtual network service			
Country	AT&T	MCI	Sprint
Australia	✓	✓	
Belgium	✓	✓	
Canada	✓	✓	✓
France	✓	✓	
Hong Kong			✓
Italy	✓	✓	
Japan	✓	✓	
Netherlands	✓	✓	
Norway	✓		
Singapore	✓	✓	
Spain	✓		
Sweden	✓		
U.K.:			
British Telecommunications PLC	✓	✓	✓
Mercury Communications, Ltd.	✓	✓	✓

Information current as of March 23.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.  
GRAPHIC BY SUSAN SLATER

price still reigns as the overriding user concern when selecting a virtual net. For many users, what matters most are the bottom-line prices, which are on their way up.

For the most part, buying virtual networks is like buying a car. The standard package is cheap, but the extra options add up quickly. In order to get the feature-laden applications that many companies are requesting, they must expect to pay up.

This is especially true for AT&T, which charges for many options that MCI and Sprint either give away or assess minimal fees for. Costs for database-intensive SDN features are out of sight. For example, to implement simple accounting codes, AT&T charges users \$200 for installation and \$400 per month for the feature, plus a \$400 installation fee and \$50 per month for the required additional screening features needed to support the codes. By comparison, MCI and Sprint offer accounting codes at no charge.

Given the extra cost for advanced features, some users are locking themselves into term plans to obtain extra discounts, but these deals are often based on tariffed rates that can change at any time. Rate stability is truly available only through a custom contract that guarantees rates.

Don't look for cost of service to be limited to per-minute pricing, either. Virtual network services are packages that include call transport, application support and

## Letters

*continued from page 29*

could raise the odds enormously on ensuring computer security, particularly from would-be hackers and worm attacks. They involve protecting front-end access to computer systems via microchip or coded magnetic cards by using security algorithms, personal identification numbers and other relatively simple and inexpensive techniques.

The media should follow through on

this problem instead of addressing it only in times of crisis. It should take the lead in informing the public and not just when the stories will sell newspapers.

Users must realize that implementing security precautions and procedures only when they perceive an impending threat is like locking the proverbial barn door after the horse has been stolen.

Arlen Lessin  
Chairman

The Lessin Technology Group, Inc.  
New York

## ETHERNET MULTIPOINT REPEATERS MULTIPOINT TRANSCEIVER



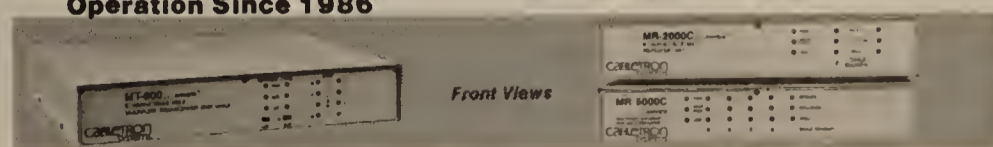
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# Kit lets users extend SNMP MIBs to support new objects

Allows Unix resources to be managed by SNMP.

By Joanne Cummings  
Staff Writer

SAN FRANCISCO — Independence Technologies, Inc. this week is expected to demonstrate at DB/Expo '92 here a software tool kit that will help users pull Unix-based network resources under control of SNMP net management systems.

The iVIEW SNMP Agent Kit enables users to extend the Management Information Base (MIB) of Independence Technologies' iVIEW SNMP Agent to support objects for managing application programs, printer daemons or disk capacity, according to Gerard Berthet, development manager for the company.

The kit does not require the user to have extensive knowledge of code writing. Additionally, it enables the new objects to be managed by any Simple Network Management Protocol management station.

The iVIEW SNMP Agent Kit is source code containing the SNMP MIB I standard and Independence

Technologies' private MIB for monitoring file systems and Unix operating system performance.

It also contains examples of ways to access MIBs, such as reading a file or using Unix kernel tables, shared memory or remote procedure calls. The kit runs on any Data General Corp., Pyramid Technology Corp. or Sun Microsystems, Inc. platform.

The iVIEW SNMP Agent, which works with the iVIEW SNMP Agent Kit, can reside on any Unix platform and communicate with any SNMP manager over a Transmission Control Protocol/Internet Protocol network.

## How it works

To integrate a new object into the agent MIB, the kit requires some knowledge of Abstract Syntax Notation.1 (ASN.1), which is the standard notation used to define all SNMP MIB objects.

The user must first define the object using ASN.1. From that description, the kit's software generates SNMP-compliant C code

for the object, obviating the need for the user to know anything about SNMP or coding, Berthet said. The user then compiles the code using any ANSI C compiler, creating a new file within the agent. This procedure adds the object to the agent MIB.

Users then consult the kit's source code for examples of how to access the new object, such as through the Unix kernel table. They then insert the access functions into the new file, creating access to the object. Thus, when the iVIEW SNMP Agent is queried by an SNMP manager, it is able to access the data within the file and communicate the requested information to the manager.

Because the new file containing the extension is SNMP-independent, it can be used again at a later date for integrating the extension into a Common Management Information Protocol agent, Berthet said.

The iVIEW SNMP Agent Kit will be available in May for \$10,000 when purchased along with Independence Technologies' iVIEW System Manager management system or \$15,000 when purchased separately.

There is an additional runtime license fee ranging from \$200 to \$1,500, depending on the type of computer used. ■

Clinics are connected every afternoon by videoconferencing as a way to examine and diagnose high-risk patients," he said. "We want to make the connection."

Although the metropolitan-area net here is a temporary network set up by DBP Telekom for the CeBIT trade show, permanent metropolitan-area nets are planned for Stuttgart and Munich. Alcatel N.V. will install the Stuttgart net, and Siemens AG will construct the Munich one.

A number of users, including Daimler-Benz AG and the Technical University of Munich, are currently trialing CBDS, and DBP Telekom is expected to make the service generally available in October.

While the effort demonstrated data exchange based on the IEEE 802.6 metropolitan-area net standard, it also highlighted differences in the European and U.S. interface standards. In the U.S., carriers plan to implement the Bell Communications Research SMDS interface standards, which support speeds of 1.54M, 45M and 155M bit/sec. European carriers will use the European Telecommunications Standards Institute interface speeds of 2.048M bit/sec (E-1), 34M bit/sec (E-3) and 140M bit/sec.

Burack said countries will have to agree on speeds, but he foresees no technical obstacles to such arrangements. ■

## AT&T plans for broadband SDN

*continued from page 1*

maintaining a private data network environment," the documents said.

Both virtual and private connections will be supported under the service, the combination of which will be needed to accommodate emerging, bursty, high bit rate applications. These applications include client/server computing, LAN-to-LAN routing and batch image processing for things such as check clearing.

The key benefits of Data SDBN, according to the documents, are "seamless integration with LANs, dynamic bandwidth to serve the bursty applications of the 1990s and reduced staff support due to simplified network management."

Optional service elements may include the ability to use fiber-optic access links for aggregated traffic up to 2.5G bit/sec and the rather unusual idea of allowing customers to instantly provision service and service options to network sites.

The multimedia version of SDBN is intended to support applications containing any combination of video, audio or computer data that requires real-time interaction.

The service, for example, could be used to support "desk-

top-to-desktop videoconferencing that includes participants retrieving and viewing database information on terminal screens along with the video talking heads," the documents stated.

Some of the options listed for Multimedia SDBN Service include video and audio protocol conversion, video and audio compression/decompression, instant provisioning of network locations by the user and multiprotocol routing and conversion.

The voice-only version of SDBN is intended to be a feature-rich, virtual network offering that can be integrated with traditional circuit-switched voice networks.

A key attribute of Voice-Only SDBN would be the ability to integrate access to the carrier network with other SDBN services, according to the documents. The other main benefit would be the optional ability to self-provision service and service options.

Although not identified as particular attributes of SDBN, the documents revealed some performance details about planned ATM-based offerings. ATM permanent virtual circuits (PVC) would have a latency of under 100 msec and a zero call setup time after end-to-end virtual circuits are predefined.

The documents said ATM PVCs could be offered in 1994, while switched virtual circuit services could be offered by 1995. ■

## International links between MANs demoed at CeBIT fair

By Ellen Messmer  
Washington Correspondent

HANNOVER, Germany — German and U.S. carriers used the Hannover Fair CeBIT show here last week to demonstrate for the first time a link between metropolitan-area networks here and in the U.S.

Over a T-1 link MCI Communications Corp. set up between the U.S. and Germany, three U.S. users trialing MCI's Switched Multi-megabit Data Service (SMDS) and frame relay service transmitted large image files to Deutsche Bundespost (DBP) Telekom's 2M bit/sec metropolitan-area net in Munich, Germany. The files were then forwarded here over a 34M bit/sec link.

Two of the users participating in the demonstration, Time Magazine, Inc. in New York and The Analytic Sciences Corp. (TASC) in Reading, Mass., exchanged image files between computers in the U.S. and CeBIT booths here.

Daniel Baker, manager of software engineering at TASC, said his company is a beta site for MCI SMDS.

According to Martin Burack, MCI's senior manager of data market development, the third

U.S. user, Cray Research, Inc. in Minneapolis, is a beta site for MCI's frame relay service. He also said MCI converted Cray's frame relay transmissions to SMDS cells as part of the demo, adding that last week was the first time MCI publicly demonstrated this conversion feature.

German companies beta-testing DBP Telekom's metropolitan-area network service, called Connectionless Broadband Data Service (CBDS), said they hoped that the emerging high-speed switched data service will give them a cost-effective way to videoconference and access database applications on local-area networks.

"We're considering [CBDS]," said Ulrich Streese, net manager at the Charite medical facility for Humboldt University at Berlin. "We want to be able to exchange X-ray images and data."

Dr. Achim Kuerten, a physician at Charite, said the clinic would also like to find a cost-efficient way to videoconference with doctors at the Mayo Clinic, based in Rochester, Minn., which now has a videoconferencing system connecting a string of hospitals across the U.S. "Seven Mayo

## Forum nears spec completion

*continued from page 4*

data traffic and to handle inter-company communications.

Where SVCs make sense will depend on tariffing. "If PVC prices are kept low, there would be little reason to use SVCs," Lippis said. "But if PVC prices rise, SVCs could make sense."

But equipment vendors may be slow to implement SVC support. "They're nervous enough about supporting PVCs and handling congestion," he said. "SVC support will come later."

The forum's technical committee also hopes to finalize a specification for multicasting — the ability to easily send a single message to multiple addresses on a frame relay net.

A rudimentary multicasting capability was specified in the local management interface (LMI) by the forum's founders but was neither accepted by standards bodies nor implemented widely.

The committee is also defining an intelligent network-to-network interface it hopes will be widely implemented by equipment vendors. This interface will enable users to not only pass data between private frame relay nets or private/public nets, but ex-

change other key information, such as LMI, committed information rate and billing data.

Carriers, such as WilTel, that have experimented with internetwork links say current connections cannot handle that type of data.

That could lead to problems. For instance, one network would be unable to convey that it is congested and another net could continue to flood it with data.

Users say an intelligent interface is critical to the long-term success of frame relay.

"X.25 succeeded because of gateways that allowed users to [interconnect] services," said John Boyd, a senior engineer with Northeast Utilities, a Berlin, Conn.-based power company. "An [intelligent] interface is mandatory if frame relay is going to replace X.25."

Despite the promise of the new features, not all frame relay equipment vendors plan to support them. For example, StrataCom, Inc., whose switches are used by AT&T, CompuServe, Inc. and WilTel, said it will implement the intelligent interface.

But the firm said it has no immediate plans to support SVCs. "There's no customer demand for SVCs," a StrataComm spokeswoman said. ■

## New message engine due

*continued from page 1*

of writing transport code and let them get on with writing more sophisticated messaging-based applications that can automate work flow.

Due in early summer, the first available NLMs will include a multiprotocol engine that will ship with the first ever NLM version of MHS, according to sources. Although Novell refers to the engine as a separate entity, it relies on MHS for directory services, among other things, and requires use of the MHS NLM.

"The [multiprotocol] engine will be a future part of messaging that is compatible with MHS, not a replacement," said Carey Heckman, director of messaging product marketing at Novell, based in Provo, Utah. "It extends MHS and allows it to use other mail protocols like SMTP or SNADS or [Apple Computer, Inc.'s] Open Collaborative Environment."

### Enhancements

The MHS NLM will offer several improvements over Novell's current DOS-based MHS, including a hierarchical directory system, which will eventually be supplanted by NetWare's own directory services when the company ships NetWare 3.2 later this year, sources said. It will also feature

an expanded 256-character name space and other improvements.

Although not all of the details on the multiprotocol engine were available, sources said it will act as a "gateway" that negotiates the path a message will take among the messaging NLMs.

For example, users running an MHS-based E-mail package could send messages to SNADS or SMTP-based servers through the same conventions they normally use. The engine would intercept those messages, translate them into the appropriate format and forward each to the correct server in its native format. Currently, MHS users on NetWare local-area networks must use a mail gateway specific to a particular mail engine. In addition, MHS is not currently available as an NLM and must reside on a separate DOS-based server.

Application developers will be able to tap the multiprotocol engine's services through Novell's Standard Message Format (SMF) messaging interface, a new version of which is also expected to be announced this week.

With the new SMF, third parties will be able to develop applications to work with the multiprotocol engine using MHS application program interfaces (API), Microsoft Corp.'s Messaging API or the Vendor Independent Messaging API.

Novell will ship SMTP and

SNADS NLMs sometime after the initial MHS release, sources said. The company has also demonstrated Apple's OCE running under the multiprotocol engine, but has not committed to offering the product. OCE is Apple's environment for creating collaborative applications, which includes messaging services.

Novell is leaving X.400 support up to third-party vendors, who can add their implementations through the X.400 Application Program Interface Association's API, sources said. However, it is not clear whether Novell will release the APIs vendors will need to create other messaging NLMs that will work in the architecture.

For users who have struggled with Novell's haphazard messaging strategy, NetWare Global Messaging should be good news.

"Novell's messaging strategy has been very fragmented," said Jamie Lewis, vice-president of information services for The Burton Group, a research and consulting firm based here.

Novell has worked on messaging with a several vendors in the past but done little on its own, Lewis said. Others agreed.

"Until now, Novell has chosen to be a bystander," said Ann Palermo, director of work group and messaging research at International Data Corp., a research firm in Framingham, Mass. ■

## Low attendance raises questions

*continued from page 2*

The earlier show raised expectations about MAP/TOP that never panned out in the marketplace. Many vendors that exhibited at ENE '88 and spent money developing MAP/TOP products were disappointed when users failed to show much interest in those offerings, said James Hardy, chairman of networking and communications in the manufacturing group of the Society of Manufacturing Engineers, which sponsored both ENE '88 and '92.

"The [ENE] conferences coincide with the rise and fall of MAP," said H.B. Stormfeltz, director of the corporate computer-aided acquisition and logistics program office at Northrop Corp. in Hawthorne, Calif.

Recognizing that another show devoted to MAP/TOP would spark little interest among vendors and users, ENE '92 organizers decided to focus on OSI and gear the sessions and exhibits to OSI products and technologies commercially available today. But evidently, that theme failed to rouse much interest, either.

Bonnie Tew, the show's organizer for SME, attributed the low attendance partially to the recession and the fact that the show does not occur annually. However, she admitted that the turnout raises a lot of questions about the status of OSI.

"Perhaps it only is a small, narrowly focused group of users who are really interested in using OSI," Tew said. "Or maybe OSI is too expensive."

Most attendees and speakers said they did not believe the poor attendance reflected a lack of interest in OSI, while acknowledging that OSI usage has been limited to the federal government.

Some said users and vendors are more focused on TCP/IP and cited the popularity of the INTEROP shows, which highlight the use of TCP/IP to interconnect multivendor platforms.

Keynote speaker Tony Barrese, vice-president of NCR Corp.'s network products division, said it is a misconception that OSI has not been widely accepted. He said the lower layers of OSI — the 802.XX communications standards — have been widely implemented.

However, Barrese said, OSI has been less successful on the application side.

He said few users have tackled the upper layers of OSI and few vendors have used them to develop OSI applications. This is changing, however.

Barrese predicted that there would be significant growth in OSI-based messaging via the X.400 and X.500 protocols. He said vendors are already developing products for X.400 and X.500 and pricing will eventually become a nonissue.

Once X.400 and X.500 be-

**"The [ENE] conferences coincide with the rise and fall of MAP," Stormfeltz said.**



come more widely used, companies will begin implementing other OSI applications.

Barrese and several users attending the show said OSI and other open protocols, namely TCP/IP, will coexist in networks for years to come.

One user from a major manufacturing company who requested anonymity said his plant initially backed MAP, but when MAP-based products failed to materialize, it implemented TCP/IP over Ethernet. "We'll implement OSI gradually when it makes sense, just as we have done with TCP/IP," the user said. "I suspect OSI and TCP/IP will coexist in our net for years to come." ■

## Device limits packet storms

*continued from page 2*

and drive up network costs, he added.

CrossComm's software increases the efficiency of NETBIOS internets by tapping the capabilities of the ILAN's recently redesigned bridge/router ("ILAN router to get key SNA support," NW, March 9).

### Engine is essential

Key to the new architecture is a hardware-based Address Processor & Directory engine that enables the bridge/router to learn detailed information about devices on the internetwork, including their media access control (MAC) address, network address and, if applicable, a NETBIOS name or Transmission Control Protocol/Internet Protocol address.

Earlier versions of ILAN only maintained port number and MAC-layer address information on each device.

The new software watches for NETBIOS messages and stores the information in a real-time name and address table maintained by the engine. With that information in hand, the ILAN can then direct the NETBIOS packet to the LAN where the destination

station resides, rather than broadcasting it across all available wide-area links.

Packets are then forwarded across a single wide-area link. This reduces costs and improves performance because it lessens the amount of traffic flowing over the link.

Typical bridges, on the other hand, simply forward packets to internet nodes because they can only gather information at the individual layer and have no way of determining which station created the NETBIOS broadcast.

Robin Layland, engineering consultant at Travelers Insurance Co. in Hartford, Conn., said the new software will be a boon for his large IBM Token-Ring bridged network.

"It limits the effects of NETBIOS broadcast storms," he said.

"Since these messages are broadcast throughout the network, every ILAN automatically learns the location of network devices, which is an improvement over [the capabilities planned for] IBM's new 6611 router."

The NETBIOS broadcast storm prevention software is available now and costs \$950. ■

### Alleviating NETBIOS broadcast storms

1. CrossComm's ILAN bridge/router broadcasts packets from local node seeking destination node.

2. PC on LAN C acknowledges packet receipt with address information.

3. ILAN bridge/router maps IBM's NETBIOS name and LAN association and stores it for future reference, making it possible to target future packets directly to that LAN and eliminate broadcast storms.

GRAPHIC BY SUSAN SLATER

SOURCE: CROSSCOMM CORP., MARLBOROUGH, MASS.

## MCI bests rivals in bid for air net

*continued from page 2*

to data transmissions at speeds ranging from 2,400 to 45M bit/sec.

The need for the upgrade was driven home last year when AT&T experienced an outage that knocked out air traffic communications to three major airports serving the New York metropolitan area. The air traffic system currently comprises a maze of about 14,000 private lines from numerous carriers with varying network architectures and performance standards.

Air traffic communications in the New York area were carried by AT&T, and during the outage, it was discovered that communications for all three airports were routed through a single central office switch, with no redundant routing or switching facilities. AT&T's central office was knocked out by a power failure last year, cutting off communications to pilots and air traffic controllers in other regions outside New York.

That outage snarled air traffic across the country and raised the ire of many lawmakers in Washington, who demanded to know

*(continued on page 47)*

# A crop of X.400 products emerge

continued from page 1

Communications Resources (ISOCOR) demonstrated 1988 X.400 messaging, electronic data interchange and security software at Hannover Fair CeBIT in Germany ("Start-up intros X.400 mail, EDI and security products," NW, March 2).

Established messaging vendors, such as Digital Equipment Corp. and Soft-Switch, Inc., also plan to roll out 1988 X.400 products this year. And carriers such as AT&T EasyLink Services, MCI Communications Corp. and Sprint Corp. plan to support the 1988 version on their value-added nets, probably next year.

The 1988 standard includes important features not available in the original standard, which was published in 1984 and is the basis of nearly all X.400 products today. Among the new features are security, support for X.500 directory services, a standard mailbox feature for storing messages and improved capabilities for handling nontext messages.

"Products based on the 1988

X.400 standard will help drive the X.400 messaging market," said Don Gilbert, information systems director at the American Petroleum Institute, a trade association in Washington, D.C.

Barbara Nelson, a senior systems architect at Retix, a Mountain View, Calif., software provider, agreed that the 1988 version holds much promise, especially for large electronic mail users. She warned users, however, not to expect too much too soon.

"The 1988 standard gives a lot of additional functionality over the 1984 [version], but the initial 1988 products probably will not offer all of those new services," Nelson said. Retix has issued 1988 X.400 source code that is designed to help messaging software vendors build products.

## Safe and sound

According to Nelson, the 1988 version of X.400 supports a full plate of security features, something the 1984 version addressed briefly. "1988 X.400 basically supports security features to address every potential threat to a global E-mail network," she said.

One major security feature is authentication, a mechanism for verifying that both the sending and receiving parties are authorized to exchange messages. Another security function, called nonrepudiation, calls for a third-party to authenticate that a message has been sent.

Another security feature is data integrity, which ensures that messages are not changed in transit. For example, the feature would guarantee that a \$1,000 deposit notice sent over a bank net is not accidentally credited as a \$10 transaction.

The 1988 version also provides for confidentiality of messages through encryption.

ISOCOR's ISOSEC 800 software provides authentication of the communicating parties, data integrity and nonrepudiation for EDI and other electronic messages, according to Andy De Mari, ISOCOR's president and chief executive officer.

"The lack of strong security capabilities in the 1984 version means X.400 has not been widely deployed in the financial community or government," he said. "There are some good opportunities here."

## Looking for directories

The 1984 X.400 standard, published prior to X.500's existence, turned off many large users because of its lack of support for directory services.

Users have been forced to build their own directories and link them across a network, a time-consuming and difficult chore, according to Steven

Thompson, director of gateway services at Soft-Switch, a Wayne, Pa., maker of electronic messaging gateways and other products.

The 1988 X.400 supports X.500, similar to an electronic yellow pages. The sender enters a name in a message's address field, and the messaging system delivers it via the Message Transfer Agent, which finds the address in the X.500 directory.

"X.500 holds the promise of moving directory services from being an art into something that is usable by end users," Thompson said. Users can retrofit 1984

nized, rather than the mail system just saying, 'You've got mail here, now deal with it,' " Nelson said.

## Plain old notes

Another feature of 1988 X.400 is inherent support for all types of messages, not just text messages. For example, a user could send a spreadsheet file in a message that would automatically be translated into whatever format the recipient desires.

Currently, 1984 X.400 defines a Body Part 14 specification that permits transmission of un-

based on the 1988 version of X.400 are starting to emerge, users face a tough choice. Should they rely on products based on the mature 1984 version or buy directly into the 1988 products?

"The timing is right for users to take a good, hard look at some of the issues addressed by 1988 X.400," said Gary Rowe, core services director at AT&T EasyLink Services. "Customers who really care about some of the enhancements in the 1988 [version] might want to pilot some products. But they shouldn't just buy 1988 products for the sake of buying [them]."

Donaghy said he is anxious to give 1988 X.400 a whirl.

"I can't imagine why anybody wouldn't want to buy 1988 products," said Donaghy, whose company is plotting its migration from a hodgepodge of mail systems to a 1988 X.400 net. "The 1988 products will need to be tested, but I don't think we will go through the trauma we went through with getting [products based on the] 1984 [standard] up [and running]."

Others are more cautious. American Petroleum's Gilbert said he is content to get experience with the 1984 products. "I feel sorry for the people who jump straight into 1988 [products]," he said.

## For the long run

Dan Blum, a principal at Rapport Communication, a consulting firm in Washington, D.C. that specializes in electronic messaging, said adoption of the 1988 systems will be gradual but likely to pick up momentum next year.

"In the long term, users will want to go with the 1988 standard because it's more functional than 1984," he said. "In a few years, 1984 will seem like a bad dream."

Users looking to buy into X.400 now may choose to implement 1984 X.400 software initially and get assurances from vendors that there will be upgrades to 1988 X.400 software.

Limited availability of 1988 X.400 products could make interoperability testing difficult, he added. There are also questions about how well 1984 and 1988 X.400 software will work together.

Another question that remains to be answered is how aggressively vendors will deliver 1988 X.400 products, said Chris Moore, a principal at Messaging Devices, a Palo Alto, Calif., consulting firm.

"The 1984 products haven't exactly been selling in droves," he said. "The 1988 standard provides a superior solution to the companies that build products, but their real incentive will be customer demand." □

## Selected 1988 X.400 offerings

Vendor	Product	X.400 and X.500 support
<b>Infonet Services Corp.</b> El Segundo, Calif. (310) 335-2600	Notice 400, a public X.400-based messaging service	1988 version of X.400 planned for 4Q
<b>International Standards Open Communications Resources (ISOCOR)</b> Los Angeles (301) 476-2671	ISOPLEX 800 messaging system, ISOTRADE 800 EDI software, ISOSEC 800 security software	1988 version of X.400 planned for midyear
<b>Joiner Software, Inc.</b> Madison, Wis. (608) 238-4454	JMail-MHS Version 1.2	1988 version of X.400 gateway and address mapping planned for this year
<b>MCI Communications Corp.</b> Washington, D.C. (800) 444-6245	MCI Mail	1988 version of X.400 planned
<b>NCR Corp.</b> Dayton, Ohio (513) 445-5000	NCR X.400, NCR OSI/Internet Gateway, AT&T EasyLink Gateway planned	1988 version of X.400 planned for 1993
<b>Retix</b> Santa Monica, Calif. (310) 828-3400	OpenServer 400, SMTP Gateway to X.400, MHS to X.400 Gateway, cc:Mail Gateway to X.400, Microsoft Mail for Macintosh Gateway to X.400, Microsoft Mail for PC Networks Gateway to X.400	1988 version of X.400 planned for this year
<b>Soft-Switch, Inc.</b> Wayne, Pa. (215) 640-9600	SNADS Gateway/cc:Mail, SNADS Gateway/Microsoft Mail for PC Networks, SNADS Gateway/VINES Network Mail, SNADS Gateway/Higgins, SNADS Gateway/3Com	1988 version of X.400 scheduled for 2Q
	SNADS Gateway/Microsoft Mail for AppleTalk Networks	
	Lotus Notes Gateway	
	NetWare MHS Gateway	
<b>Sprint Corp.</b> Lenexa, Kan. (800) 736-1130	Sprint Message Xchange for LANs and SprintMail, public messaging services	1988 version of X.400 planned for this year

SOURCE: NETWORK WORLD AND RAPPORT COMMUNICATION, TAKOMA PARK, MD. GRAPHIC BY SUSAN J. CHAMPENY

X.400 mail systems to work with X.500, but the implementation would not be as smooth.

The 1988 version also features the Message Store, which adds another level of functionality to messaging, observers said. The Message Store, which typically resides on a message server, is a mailbox that holds messages, notifies users that messages are waiting and offers options for retrieving them.

Since the 1984 X.400 version does not support this function, messages can go undelivered if a recipient is not on-line when the message is sent. This can be a problem for users that spend a lot of time on the road.

The Message Store lets users screen messages using certain parameters. "The Message Store gives you a way to have mail orga-

defined messages, such as spreadsheets or word processing documents. But the sender and the recipient must first agree on a common format, otherwise, the recipient does not know what kind of message has arrived.

Some members of the Electronic Mail Association, an industry trade group, are working to bolster 1984 X.400-based products so the products can better support various documents.

"More users are getting bored with sending plain old notes and messages," said Peter Donaghy, manager of Hughes Aircraft Co.'s Customer Services & Support Laboratory in Long Beach, Calif. "Users are trying to do things like send files, and files can be anything from spreadsheets to attachments onto text messages."

Now that messaging products

## NETWORK WORLD

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## MCI bests rivals in bid for air net

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how public safety could be jeopardized by a bad network design. The FAA has been planning the LINCOS upgrade since 1990, but the contract was held up in a fight over the government's larger Federal Telecommunications System (FTS) 2000 contract.

All federal agencies are required to use FTS 2000 unless they have specialized needs. According to MCI, the FAA laid out about 60 technical requirements for LINCOS, of which only about 15 could be met by FTS 2000. Still, the FAA had to fight with lawmakers for almost a year to have the air traffic net exempted and made

eligible for separate procurement.

MCI said the new LINCOS contract will save the FAA about 50% over current network costs. But more importantly, FAA officials say the contract will rehabilitate the aging network.

In the LINCOS contract, the FAA demanded network availability of 99.999%, which translates into about five minutes of downtime per year, said Mike Serbousek, program manager for MCI's FAA LINCOS. The LINCOS contract also requires fully redundant links on the digital backbone for access.

The LINCOS network will be built on existing MCI facilities and supplemented by additional redundant switching, and transmission and access facilities, Serbousek said.

If MCI is unable to provide redundancy through its own network, it will lease facilities from local carriers or alternative access providers.

At each of the 156 critical sites, MCI will build a network hub using Newbridge Networks, Inc. T-1 and T-3 multiplexers and a Newbridge network management workstation.

While MCI was savoring its victory last week, Sprint issued a statement complaining that the government may have acted too quickly in awarding the contract. Sprint said the award was made only five days after prices were submitted and questioned "whether there was thorough and careful evaluation and analysis . . ."

A Sprint spokeswoman said the carrier is evaluating its options, but she was not prepared to say whether Sprint would protest the award. However, the carrier asked for the contract to be suspended until technical demonstrations could be performed.

MCI was shut out of virtually all government business after it lost a bid for FTS 2000 to AT&T and Sprint in December 1988. Since then, MCI has vigorously pursued government traffic falling outside the scope of FTS 2000 and has even asked Congress to remove the mandatory use of FTS 2000 from federal agency requirements.

Earlier this month, MCI won a contract to carry international traffic for all federal agencies. **□**

## Gupta set to offer upgrades

*continued from page 4*

The announcements reflect the firm's continued momentum.

In a new version of Quest to be announced today, Gupta has added connections to back-end servers, including IBM's OS/2 Database Manager, Microsoft Corp.'s SQL Server and Oracle Corp.'s Oracle Server. These links require Gupta's router and gateway software.

Both Quest 1.2 and the new Version 3.1 of SQLWindows contain the latest release of SQLBase

Version 5.0. That means applications developed using SQLWindows 3.1, which is a graphical client/server application development system, will be able to take advantage of SQLBase 5.0's new capabilities.

Gupta is also providing updates for three software components that make up SQLNetwork for DB2 3.0, its connectivity software that provides personal computer access to "live" DB2 data on a host. These new releases are faster versions of its host connectivity software called SQLHost/DB2 3.0, a new host-based product called SQLHost/Application

Services that enables programmers to write server applications that can access IBM CICS data and other mainframe resources, and SQLGateway/APPC for NetWare, an NLM version of Gupta's host gateway software.

Wolf said the SQLHost/Application Services introduction is significant because it is the first time Gupta has let users create their own server applications.

"With this new software, CICS programmers can write server applications, which means that anything that can be done on a mainframe can now be done in a client/server configuration with

the client PC front end interfacing with the new mainframe application," he explained.

Wolf also said users can expect Gupta to work closely with Novell on converting all its server and connectivity software into NLMs over time so users will have the option of running these programs on their file servers.

The Quest and SQLWindows versions will be available at the end of the month, and the SQLBase and SQLNetwork versions will be available by June. Pricing and upgrade programs vary by product and configuration. **□**

## CA to unveil new dBFast version

*continued from page 4*

though he declined to detail the product's market share.

At Comdex/Spring, CA will announce Version 2.0 of dBFast and outline its future plans for the DBMS. Version 2.0 will ship early this year and will include

new object-oriented programming tools.

But the company plans to roll out a client/server version of dBFast by year end.

That version will enable users to load a dBFast DBMS engine onto a local-area network server that supports dBFast clients on an IBM Network Basic I/O System or Novell, Inc. NetWare LAN.

Currently, users can store dBFast data on a LAN server, but the dBFast engine runs on individual LAN clients. Vinberg said the DBMS engine will perform better on powerful LAN servers.

The client/server version will also support multiple database interfaces, a key component of CA's CA90s plan to support dis-

tributed computing across computer platforms. Users will be able to configure CA-Datcom, CA-IDMS, dBFast and SQL applications to access data from dBFast.

Vinberg added that, within the next two years, CA plans to deliver software tools that enable dBFast to exchange data with DBMSs across a network. **□**

# CA's distributed computing vision closer to reality

ISLANDIA, N.Y. — Step by step, Computer Associates International, Inc. (CA) is bringing its CA90s vision for distributed computing closer to reality.

At a briefing at the software giant's new corporate headquarters here last week, CA officials said that, during the next two years, the company will roll out local-area network-based electronic mail software that inter-operates with its mainframe messaging software, new distributed database tools for VAX and Unix minicomputers, and new security products that enable users to control Unix workstation password and access privileges from IBM main-

frames.

The LAN version of CA's mainframe messaging software, CA-eMAIL+, will run on IBM's Network Basic I/O System and Novell, Inc. NetWare LANs, said Anders Vinberg, CA's senior vice-president of research and development. It will interoperate with the host software and also support X.400.

In addition to the LAN E-mail package, Yogesh Gupta, CA's vice-president of R&D, said the vendor expects to begin beta-testing next quarter a VAX version of its CA-IDMS database management system, currently available on mainframes and MS-DOS microcomputers.

Beta tests will likely last three to six months before CA begins commercial shipments, Vinberg added.

Within two years, CA plans to port its CA-DB:STAR distributed DBMS software to VAXes. CA-DB:STAR enables CA-Datcom DBMSs to interoperate with each other but now only with the mainframe CA-Datcom.

Vinberg said CA is working on distributed DBMS software for its CA-IDMS DBMS that should be available within two years.

The company plans to begin beta-testing in this quarter Unix versions of its CA-Top Secret and CA-ACF2 security software.

Currently, the software can

be used to control password and access privileges on mainframes, VAXes and personal computers linked to the host over a network. The Unix version will enable mainframe systems administrators to control security for Unix computers on the net.

Additionally, CA is now launching beta tests of systems management software for Hewlett-Packard Co. minicomputers that handles such chores as disk administration, job accounting and data backup.

Vinberg said the HP systems management software should ship within six months.

— *Barton Crockett*

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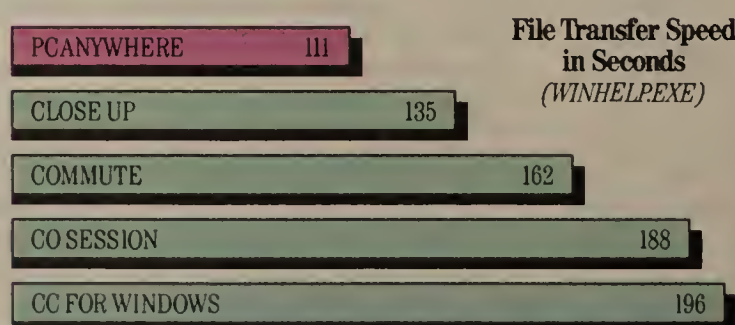
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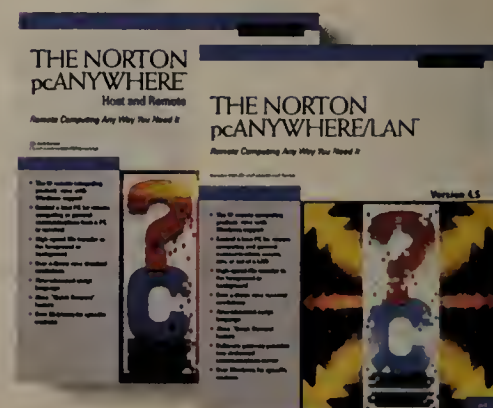
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